Honey

NATURE'S GOLDEN HEALER



GLORIA HAVENHAND

There is growing evidence to show that honey is hugely beneficial to our health, from its antibacterial properties to helping relieve hay fever to even inhibiting the growth of cancer cells. With increasing numbers of people interested in ditching drugs for natural alternatives to combat health problems from allergies to acne, this book is a timely look at how the beehive can help us look and feel better.

Drawing on her background in biological sciences, Gloria Havenhand demonstrates that honey is essential for healthy living—boosting the immune system and helping prevent certain diseases. She not only illustrates the many ailments that honey can help alleviate, including IBS and gastric ulcers, but shows how to use honey to reap its full health benefits. Gloria also reveals how we can harvest the beehive for anything from reviving tonics to beauty treats. This book includes chapters on propolis, a sticky resin, which can help skin conditions such as psoriasis; pollen used to relieve hay fever and boost the immune system and royal jelly and beeswax used in cosmetics to rejuvenate the skin.

Accompanied by information about the beehive and life of the honeybee, this illuminating book shows us the links between honey and good health and why protecting the honeybee is important not only for its own survival, but for our own longevity.

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PHOTOGRAPHY BY CRISTIAN BARNETT

FIREFLY BOOKS

DEDICATION

This book is dedicated to my husband Donald and son Giles, for their never-ending and in-depth criticism. They are both excellent beekeepers. They think I am mad.

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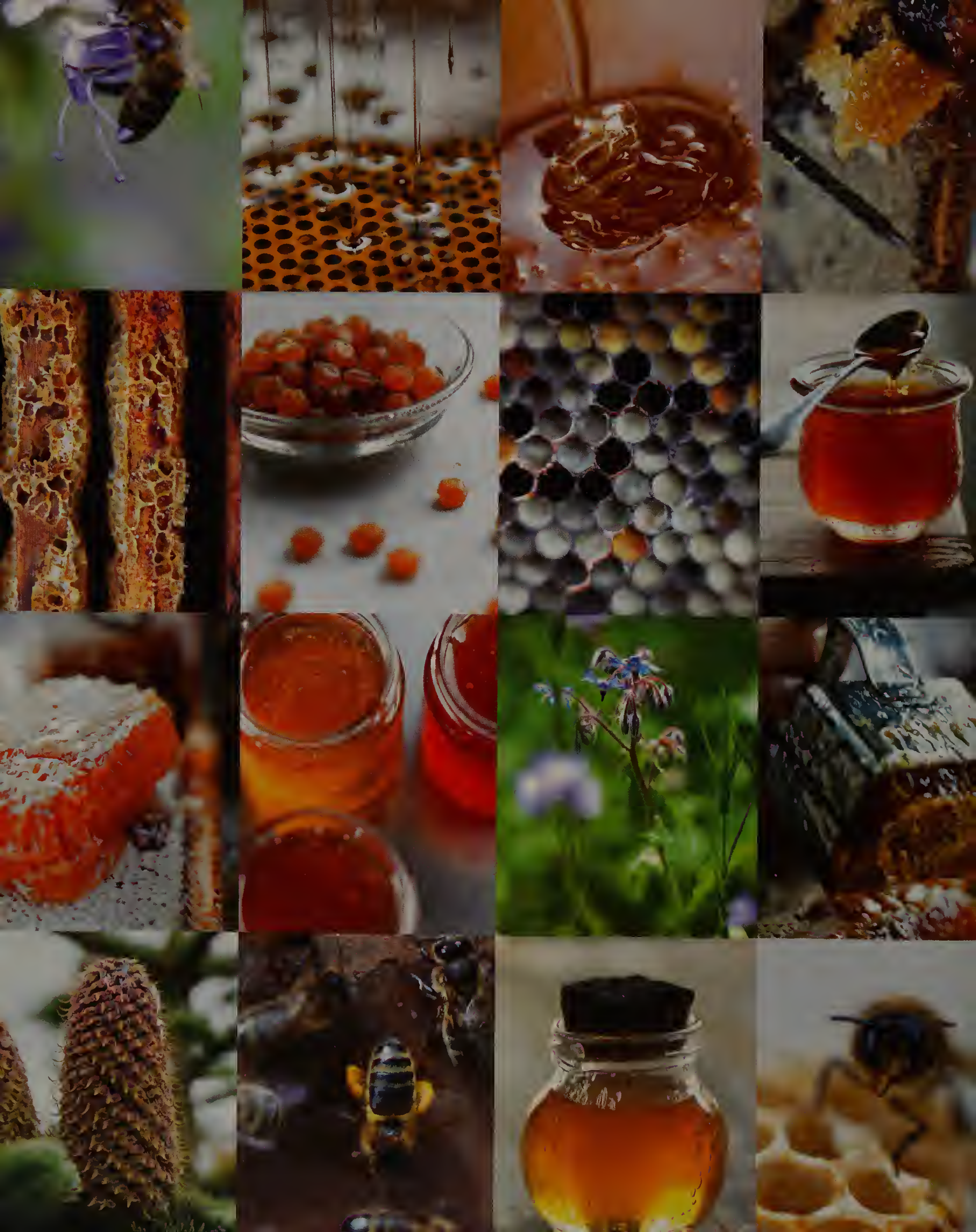
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IMPORTANT NOTE TO READERS

This book contains information on herbs and remedies that can be used medicinally. It is not, however, intended as a medical reference book. Before trying any remedies, herbal or otherwise, the reader is recommended to sample a small quantity first to establish if there is any adverse or allergic reaction. The reader is also advised not to attempt self-treatment for serious or long-term problems without consulting a qualified doctor. Neither the author nor the publisher can be held responsible for any adverse reactions to the recipes, recommendations or instructions contained herein, and the use of any remedy or herbal derivative is entirely at the reader's own risk.



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Introduction



"I adore honey—local honey," echoes the emphatic cry from the Dowager Duchess of Devonshire, commonly known as Debo. This woman commands tremendous respect and has made the Chatsworth Estate one of the best-known stately homes and gardens in England. She lives in Derbyshire, barely a few miles from me and my bees, and confesses that honey is her true love. When visiting friends she appreciates their efforts to provide this basic treat for her at breakfast. To be truthful, she would be amazed if it were not on the table. Deborah Devonshire has lived in wealth—and more importantly in health—all her life. She is 90 years old, yet doesn't look it and certainly doesn't act it.

"You must appreciate the health-giving properties of honey then?" I ask expectantly.

"Oh no, I know nothing about them. It's just a fancy you see—I simply like honey—I always have. My father loved honey too. I don't have just a spoon or two either; probably a jar or more a week."

You could have knocked me down with a feather. My ranting about the great healing and medicinal powers of honey fluttered around her ears, falling to the floor stone dead—for her, honey was just a fancy. But why should she be any different from the millions of people across the world, from every continent, every religion, creed and color, whose natural fancy is honey?

Why do millions of us cling to honey if we know nothing about its shotgun ability to kill germs and infection? Mother Nature has made this rescue remedy so irresistibly sweet and comforting—so thick and syrupy, with such a soothing texture—that we don't give its medicinal qualities a second thought. Our ancestors used medicines from the beehive without question—not just honey, but propolis, pollen and beeswax—because they worked and helped them to heal when nothing else did. Tribesmen throughout Asia and South America still risk their lives invading wild beehives hanging from trees and rock faces. They bear excruciating stings from defending bees, even risking death to lift this precious sweetener and divine liquid sunshine to their lips. I doubt if they have been tutored in the remarkable benefits of honey—they just devour it as often as possible. They put it on wounds and charge their body with every drop they eat.

Although we have so much knowledge today, most people know very little about honey and its healing powers. But still we instinctively turn to it when we feel under the weather. Sore throats, chesty coughs and heady colds make us reach for the honey pot. Instantaneously, an energy burst explodes in a flagging body and soreness is soothed by its satiny texture.

So what facts are we missing? Above all that honey is so powerfully antibacterial it is used in hospitals to treat infected surgical wounds, overpowering superbugs that refuse to respond to antibiotics. Research in New Zealand has shown that honey deserves to move into the serious league for healing and restoring infected and inflamed skin, from wounds and ulcers to burns. In the United States, honey has proven itself head and shoulders better in relieving nighttime coughs in children than proprietary cough suppressants containing dextromethorphan. Honey has no side effects: it is pure and most of all effective. Even the World Health Organization recommends honey for soothing sore throats. Yet this is just the tip of the iceberg—for honey secretly and tirelessly works in metabolic multiplicity, regulating our bodies through an active day, while winding us down at night to ensure a refreshing sleep.

It is my mission to make sure that the superlative healing properties of honey and the other produce of the





hive become better known—as the universal panacea they truly are, as well as a truly delectable natural foodstuff. But I am also motivated by those who make the products—the honeybees. Because if we value their products we might do more to safeguard their future.

Honey only comes from honeybees—nobody has been able to invent or develop a machine (or the materials) to manufacture honey—and for them honey-making is an industrial process that mocks the modest attempts at industry plied by man. The raw material, nectar, is gathered laboriously from thousands upon thousands of flowers. Bees are an enviable workforce: they can work nearly 24 hours a day and swear unswerving allegiance to their "boss," the queen bee. They ask for nothing in return except their tiny food collections.

Never a morning begins without my visit to the bees on the upper meadows. Are they flying? Are they busy? What sounds are they making? I instantly know the weather from the bees. They are the sounding board of our environment and put official weather forecasters to shame with their accurate predictions. But bees are no different from any other living thing on this planet. They hunt for food and water like any other wild animal, and are just as subject to disease and attack from mammals, other insects, birds, molds, germs and all manner of parasites—that's besides anything we humans throw in their direction. Nevertheless, they have survived for more than 100 million years.

No Bees, No Honey

But the bee population has plummeted by 50 percent in the U.S. over the last 30 years and by 30 percent globally. In the last few years a mysterious problem called Colony Collapse Disorder (CCD) has devastated the world's bee population. One week the bees are buzzing and filling the hive to bursting, the next week most of the worker bees have gone, leaving only the queen and a thin number of young bees around her. The hive is finished, the remaining bees being too weak to collect nectar or pollen. It is a tear-jerking sight for a beekeeper—every sinew in your body feels helpless and hapless.

This should clang alarm bells in all our ears, not just those of beekeepers. Bees have the patent on honey, and if many colonies collapse it will be difficult to produce honey in the quantities demanded by expanding global populations. More important, colony collapse has implications for our ability to produce enough food to feed the planet. Honeybees are our pollinators. Every third mouthful of our food (according to Dr. Lawrence Harder, a professor of pollination ecology at the University of Calgary) comes about thanks to the armies of worker bees transferring pollen from one flower to the next. Pollination of over 100 crops worldwide is threatened. It's not just fresh fruit and vegetables that are affected. Other bee-derived products we take for granted include cotton clothing (what would we do without denim?), nuts, cosmetics, drugs and pills, car paints and industrial lubricants—all due to the hard work of bees.

What's the cause of Colony Collapse Disorder? There is no straightforward answer. The Varroa mite, a parasite that sucks the lifeblood from bees, has been blamed but CCD is a problem with many causes. Potential factors include the plant insecticides neonicotinoids, which have been condemned and withdrawn in France, Italy, Slovenia and Germany. These powerful insecticides are offered as a vigorous seed dressing and work on the nervous systems of insects, including honeybees, affecting their flight, navigation, homing and foraging systems.

This is probably not the whole picture. Bees require a cornucopia of flowers from which to select the highest-quality proteins, carbohydrates, vitamins and minerals—their immune systems depend on it and so does the hive's battle against disease. In the past decades we have lost vast swaths of wild habitat and pasture. They have been reseeded with vast acres of a single crop (or monocrop)—look out for those glaring acres of electric-yellow canola

in spring. Bees thrive on different pollens and nectars and their immune systems require endless varieties of flowers to provide the nutritional alphabet that their metabolism demands. When forced onto monocrops, their immune systems suffer, collapsing when faced with viruses that used not to be a threat.

Ancient hedgerows wind into the distance at our bee farms. Hedgerows are king in the UK, for their diversity and seasonal blossom—the bees just love hedgerow flowers and the wild plants blooming around their roots. The high standard of our antibacterial honey is thanks to hedgerows, trees and the complete flower biodiversity available to our bees. I know to the cost of my frazzled nerves that bees only forage on what they prefer. Last year they contemptuously ignored acres of phacelia flowers, dallied mildly among the wildflowers, vigorously enjoyed the hedgerows and then headed off to the heather moorland just over the hill. Heather creates one of the best antibacterial honeys on earth, so who am I to argue with their choice?

This book reveals the treasure trove of foods, pharmaceuticals, cosmetics and industrial processes that bees—and bees alone—have freely offered to our human population for thousands of years. Have we taken from them more than we have given back? Now is the time to appreciate what they have given us, to give thanks and to start making amends. We can begin by supporting organic farming, which avoids the use of insecticides. Let's take a signal from the French, who have instigated a project to sow nectar-rich wildflowers at the edge of motorways. And we can buy raw unprocessed honey, packed full of life-enhancing ingredients, at health-food stores, online and at farmers' markets. It might not provide a complete answer, but let's give these wonderful creatures all the help they deserve.







CHAPTER ONE

The Beehive



Beeswax is unique to honeybees and comes at a price because it is produced only by bees in their prime—they sacrifice 10 pounds (4.5 kg) of honey to make 1 pound (450 g) of beeswax.

Every day, customers come to an abrupt halt as they open the door to our Bee Shop. "What a wonderful smell," they proclaim. "What is it? I want to take some home whatever it is!"

The smell is made up of beeswax, honey and propolis—the essence of the beehive—because everything we stock comes from the natural riches of the hive. It is exactly the same sweet but wholesome smell that hits we beekeepers when we lift the lid off a summer beehive—the perfume emanating from the soft, golden-yellow beeswax is unforgettable. Human beings instinctively recognize this smell, and if smells could be devoured, the scent of beeswax would be a gourmet meal.

Beeswax is unique to honeybees and comes at a price because it is produced only by bees in their prime—young bees just 10–18 days old—and only in a hive maintained at a constant temperature of 95°F (35°C). Beeswax melts at 150°F (65°C)—at this temperature the hive would be in meltdown.

The building framework inside every box in the hive is constructed by the bees from beeswax. Huge volumes of stored honey are sacrificed by the hive to enable builder bees to design and develop a scaffold of wax honeycomb—the waxen warehouse for honey stores. Even more wax combs are built as cradles for baby bees. It is an unbelievable sight: hundreds of young bees hang down clutching and clawing each other in order to mold their own body wax into hollow hexagonal shapes.

Glistening scales of beeswax pop from the bees' abdomens as their legs transfer warm, clear wax scales to their own or their neighbor's mouthparts. Construction by mouth and feet commences, sometimes by older bees who are experienced builders and sculptors. Besides instinct, do younger bees learn the finer techniques of honeycomb construction from their elders? No one knows. One thing is for sure: honey stocks in the hive are seriously depleted while these master masons complete their task—10 pounds (4.5 kg) of honey is consumed to form 1 pound (450 g) of beeswax scales.

THE BIG MELTDOWN

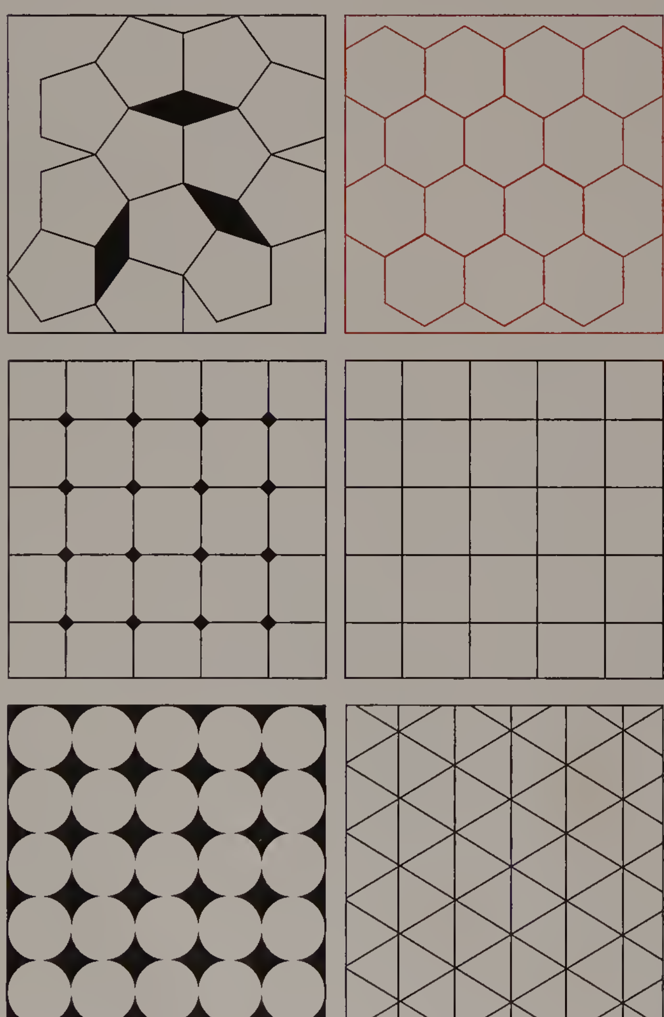
Climate change is perhaps the greatest danger bees face. If temperatures increase, entire beehives would collapse into a mass of melted wax. Our beehives were subject to intense temperatures in the summer of 2006, when the cumulative heat, day after day, caused honeycombs to melt and fuse. Streams of honey were squeezed, crushed and mixed with wax into tortuous, useless shapes. This brought a loss of winter stores for the bees and no honey for you and me.



Once the roof is lifted off a beehive the bees explode into the air and whizz around you. Take too long and they will bombard you!

Envy of Architects

Design and function reach an architectural triumph in the hive, which is formed from thousands of wax hexagons. The hexagon has strength as a shape because it is formed from triangles, which resist external force. It is also the most economical shape because it requires the smallest amount of beeswax to hold the highest volume of honey. Hexagons made by bees always point north to south, and never have a flat top or bottom. Which pattern is more efficient in holding the most honey?



Top right-hand side is the pattern cleverly chosen by the bees—the hexagon holds more honey with less beeswax in the construction of the honeycomb around.

Lift the roof off a hive and you will notice patterns of excess beeswax, which skirt around and festoon the woodwork below almost like railroad lines—bees hardly know when to stop making wax if a hive is working at full steam. The hive's horizontal wooden frames lined in beeswax lie parallel to each other, and thousands of bees appear and disappear up and down the spaces between the bars. It's like a maze, and only the bees know every entrance and exit.

The top box of a hive contains nine or 10 of these wooden frames of plump honeycomb filled with honey. Some parts of the frame are covered in a blanket of white beeswax, which lies over the stored ripe honey. Some hexagons of the comb will be open ended, revealing the glistening honey inside. These are only partially filled and the bees will be busying themselves, checking the viscosity of the honey, removing excess water by fanning their wings over the comb and finally pushing more deliveries of fresh flower nectar into the hexagons.

Beekeeping Tips

When opening a hive for the first time novice beekeepers discover their destinies in the beekeeping world. Are you terrorized by the thought of 60,000 bees in a single hive? With more than one hive you could have millions of bees in the air at any one time. Could you cope? Here are some tips:

- Before investing in bees, consider your neighbors—in high-density towns and cities, they may panic when your bees swarm.



Basic kit—you will find what suits you. Remember to check and check again that everything is zipped up tightly before starting work.

● A protective bee suit is the investment of a lifetime. Buy a good one with a rigid veil that falls down and away from the face. The cheaper ones can pull backward from your head and hang limply, which could lead to stings on the face. Check every zip, and where they meet beneath the chin, ensure that there is no space at the locking point. Bees will buzz around your veil, crawl over your gloves and seek out space at the top of boots—they'll test you and your equipment, so try before you buy.

● Handle bees as gently as you can when opening a hive. They hate jostling, clanging and banging, and will repay you accordingly. Talk softly as you take hold of one of the wooden bars, gently edging it upward. Now the whole frame of honeycomb will be revealed. Keep it in front of you to inspect it—do not turn it through 90° or the honeycomb might collapse away from the wooden frame or the honey might leak out of the hexagonal cells.



● If you disturb bees at the height of their labors or are slow or awkward in manipulating the honeycomb frames, they will not be amused. When the murmur of the bees changes to a buzz, revving up audibly almost to a scream, be prepared for them to bombard your head, flinging themselves at you like bullets with a rapid repeat action. They have had enough and are warning, "Pack up or we will sting." Do what they say, otherwise they will pierce you without further ado.

● It takes experience, dedication and learning to become proficient in handling bees in every situation—at their best and at their worst. Standing shoulder to shoulder with other beekeepers is a huge task, so do look for and accept support from those with experience, who will help to build your confidence. The American Beekeeping Federation (www.abfnet.org) provides details of beekeeping associations throughout the United States and Canada, many of which offer courses in beekeeping especially suited to beginners as well as links to other useful information and resources.

Smoker

Not used very often at Troway Hall, I hasten to add. The myth that beekeepers fade away from sight in a veil and plume of smoke is far from the truth. The vicious stocks of bees from yesteryear often demanded heavy smoking to subdue them. With better-bred bees of a calmer disposition, a beekeeper might need to lightly smoke their hives only once or twice a year.

Look at the upright smoker on this portable hive (right)



The smoker delivers cool smoke—used only when the beehive is heaving with bees and then only lightly.

—it is the original upright English version, which is now defunct. It has to be turned upside down to be effective, extinguishes itself in a few minutes and then sends more sparks and black soot into the hive than the smoke it was designed to dispense. Avoid it.

The original American smoker is my modern favorite. A massive burning chamber attached to bellows that delivers smoke at an angle—meaning the whole apparatus remains the right way up. I never use paper fuel as it burns out just as the bees become tempestuous—words cannot describe how frustrated you feel when this happens—time and time again.

The best and longest-lasting fuel is from dry burlap sacks (cut up into 3–4 inch, or 8–10 cm, squares)—make sure you light this before going to your bees, so that a stream of cold white smoke gently tumbles from the nozzle. A gentle puff of smoke into the entrance of each hive a few minutes before opening up will drive the bees onto the honeycombs where they will gluttonize on honey until they are full to bursting. An amazing behavior pattern here, for the bees are seemingly threatened by smoke (perhaps fire?) and prepare to abandon home—but not before they stock up on honey for their journey. Fat bees find it difficult to sting, too.

About the only time when I might use a smoker is when taking off heavy honey stocks in midsummer. I run a little smoke over the top parallel frames when opening the hive, so the bees go down to feed—this way, no bees are killed or injured when putting the hive back together again.

Suddenly, the beekeeper has finished, the smoke dissipates and the hive is quiescent. Be warned—too much smoke will terrify bees and drive them out of the hive entrance and heading toward you at top speed.

Just like every other action with bees—smoke very little, in light puffs and always in a gentle, caring way.



ANIMALS AND STINGS

It can be funny to watch when a few of our bees whizz over the fences and nip our inquisitive cows with a quick sting on their wet noses or around their ears. The cows kick like mustangs. But too many stings can kill cattle, pigs and horses. A serious "bee wary" for beekeepers and farmers.

Beehive Design

Modern beehives are the result of great men of design, such as the 19th-century American pastor Rev. Langstroth (see box, page 24), but the traditional beehive is a "skep." This has a very simple construction, being built up from coils of grass or straw. It's a very democratic



The original bee basket — the skep. Used no longer, the skep was made of grass or straw.

design, too: anyone can make one. Indeed, the Anglo-Saxons made rushes and straw available to everyone so that they could make their own beehives. This made perfect social and economic sense: the honey was a free foodstuff, burning beeswax would have provided light, and the other harvest of the hive worked as a medicine.

The skep has a single slit at the bottom, but unlike in the modern hive, there are no internal wooden bars from which the bees can construct honeycombs, although some beekeepers might crisscross the inside of the skep with twigs at the top. Though practically unused now (having none of the advantages of the modern hive), the skep was considered the height of practicality for centuries. Bees loved the dark, cozy interior and would carefully cover the whole of the inside with vertical beeswax combs to nurture a family of bees and store honey in preparation for the hard winter months ahead.

Every country now has its favorite type and make of hive, and the differing designs take account of the weather conditions in that part of the world and the degree of protection the bees require if honey is to be harvested on a semicommercial scale. Although the modern man-made hive is totally different in appearance from the skep and also from the wax combs wild bees fastidiously sculpt in caves or empty tree trunks, the principle of internal layers of vertical honeycombs self-built by bees remains the same. Sheets of extruded honeycomb lying side by side, like files hanging inside a filing cabinet, are the honeybee's footprint worldwide.

Our ancestors would have raided such nests in cliffs or log cavities with little thought of the lives of the bees themselves. Though honey was the target, because the bees' living quarters and honey stores were inseparable in these hives, the insects' lives would have more or less come to an end. Our ancestors would not have known how to separate the bees from the honeycomb in a skep either, with the demise of the colony of bees a foregone conclusion. In those days, stocks of bees were killed in order to collect honey and next year's honey harvest was

Famous beekeepers —who lived a long life!

François Huber (1750–1831) Although blind by the age of 15, this Swiss naturalist dedicated his life to the scientific study of bees. His work is still referenced daily by beekeepers across the globe.

Rev. Langstroth (1810–95) The beehive design of this American pastor is the most popular in the world (though not in the UK), and he was the first person to register a U.S. patent for a beehive.

Charles Dadant (1817–1902) A French beekeeper, Dadant emigrated to the United States in 1863, where he founded a beehive-making factory in Hamilton, Illinois, based on the social and productive principles of the beehive. The factory is still owned by the Dadant family.

Brother Adam (1898–1996) A monk of German descent, Brother Adam joined the Benedictine community at Buckfast Abbey, Devon, as a beekeeper and traveled the world seeking new strains of bees. Today we enjoy his legacy in the famous Buckfast Bee strain. He became the oldest monk in the English Benedictine Congregation. Brother Adam's warm philosophy was woven into the fabric of his beekeeping life: he said, "Bees are like other things—they can't do well unless they are cared for."



Bees are contortionists—they move through every angle of the compass to enter their beloved beehive.

lost unless a new swarm could be located. Bees are wild creatures contained and managed by people, but free to swarm or leave the hive in a mass migration as they will. We cannot fence them as we would sheep or cattle. Hence the phrase "to keep bees only for as long as they want to keep you." They are free spirits.

Organization of a Hive

The picture on page 20 shows the inside of a beehive. From a bee's perspective it is the ideal mobile log cabin without windows, without a back door (unless woodpeckers think otherwise) and without stairs, but with separate rooms. The queen's palace is on the ground floor. As befits her position, she has a grand apartment with a great deal of space, known as the brood chamber. This is the large box at the bottom (1). Beekeepers restrict the queen to this box, which keeps the upper boxes or "supers" (2) clear of eggs. After all, these boxes are the golden chalice, for they hold tens of pounds of honey covered with the purest beeswax. In the top box of the hive you will usually find nine or 10 wooden frames oozing with honey; the aerial view of the brood chamber reveals similar wooden frames but deeper.

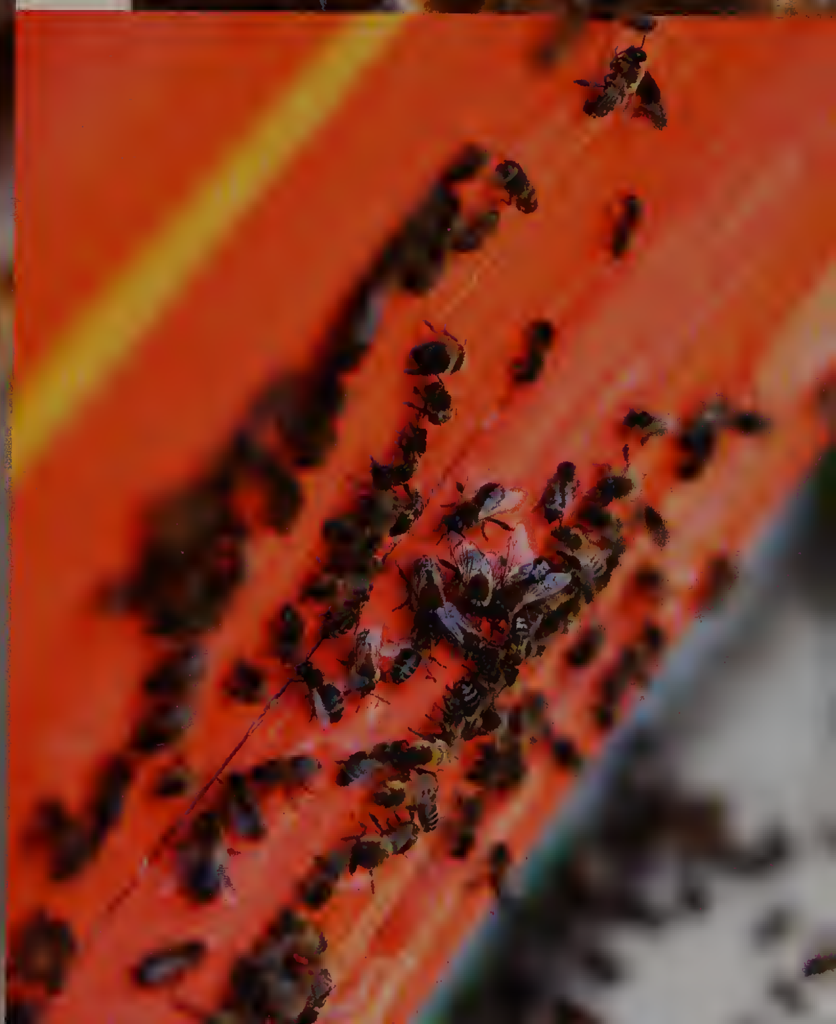
The queen is attended by ladies in waiting; her courtiers who groom her, feed her and spread her queenly pheromones around the grateful labor force of worker bees. Pheromones are volatile aromas that command the loyalty of the workers and influence their behavior toward the queen almost hour by hour. The high-intensity hormones and pheromones secreted by the queen bee will save her life. She regularly lays 1,000 or even 1,500 eggs per day every day through the summer months during her prime, which could last three or four years, for the queen lives a phenomenally long time. She will be coerced by her retinue of workers to lay six eggs a minute, one in each hexagonal beeswax cell. She lays nonstop, thrusting the tip of her long, swollen body into every individual wax cell. This requires an enormous amount of energy and the workers lick her and feed her with special food fit for a queen, aptly named royal jelly.

The queen always has the threat of "bailiff bees" around her, who sniff the air for the inevitable sharp drop in her queenly pheromones which signals that the queen's days of high egg-laying are over—just as in humans, egg production and hormones are interlinked. The queen









The female worker bees twist and turn through every angle to gather nectar and pollen from as many precious flowers as possible.

then must leave the hive: the workers feed her little and she prepares to move out to find a new home. Loyal workers do not desert their monarch, however, but fill themselves to bursting with honey. Then all 10,000 of them escort the old queen to a new site, whether a nearby tree, park bench or gate post. I recently collected a swarm from the parking lot of Radio Sheffield in South Yorkshire. The bees made themselves known to thousands of listeners on air, but were quietly lured to a waiting hive with fresh honeycomb. The swarm was rehoused successfully—one of the natural wonders of the world that never ceases to thrill me.

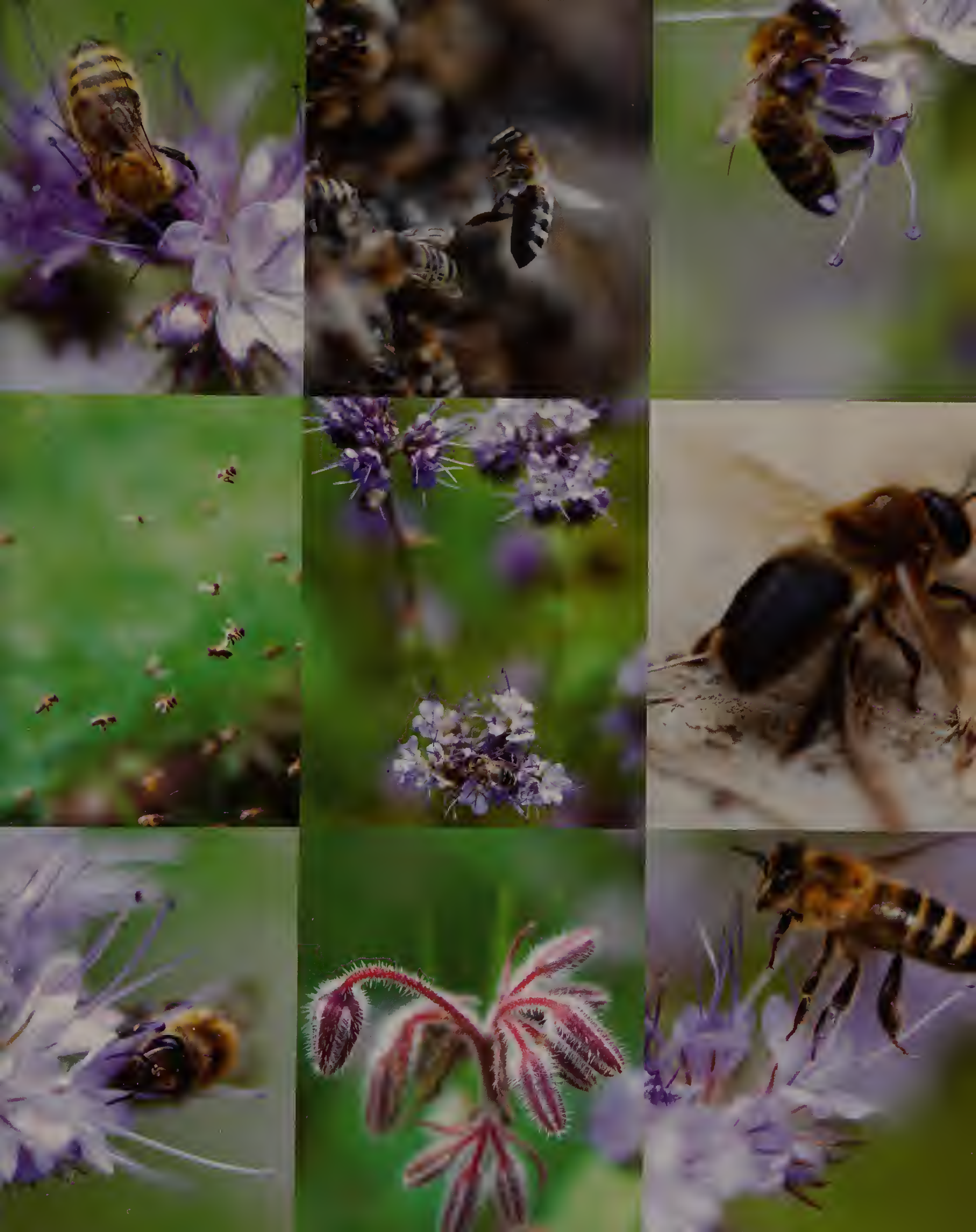
Swarms are the source of a new colony of bees, and the alert beekeeper will collect and re-hive a swarm within a day. The old queen will eventually be swapped for a new one and a new era begins. The new queen will take residence in the new brood chamber just as her predecessor did. The beekeeper will quickly place a specially sized wire or plastic mesh over the queen's quarters, which prevents her and her alone from squeezing through and moving upward to the next level, but allows the worker bees to travel throughout the hive without obstruction. Workers have much smaller bodies than the queen and once safely confined in her quarters she will not contaminate the precious honey stocks in the boxes above where she resides.

Beekeepers are a kindly but shrewd and foresighted band of individuals, and the first exercise when planning beehive design is how to keep honey stocks free of bees and other foreign bodies. If they did not do this, but instead tried to separate the honey from the bees at honey-extraction time, inevitably baby bees and hatching bees would be mulched in with the honey harvest. Would you eat honey containing segments of bees, or parts of wings and legs? Probably not, but your ancestors certainly would have before the development of the modern hive. They would have had little choice and probably regarded the bees and their larvae as an added bonus of protein and fat—they are still regarded in some parts of the world as a luxury food. Caterpillar-like tiny larvae (baby bees) and then chrysalis-contained bees are deep fried or baked to give an unbelievable delicacy of high-protein morsels, appreciated by the indigenous peoples of Mexico and Australia in addition to those of Africa—and even in parts of Lower Saxony, Germany. Ounce for ounce, baby bees pack more protein than top-grade beef!

What do baby and pupal bees taste like? A fusion between puffed rice and pork rind—unbelievably crunchy and appetizing! It's hard to believe but chocolate-covered bees are considered a high luxury in Mexico—and they are even canned so that they can be exported internationally. Maybe our diet would be better served if we thought this way, too—but never, ever in this age of dearth and with the decline in bee populations worldwide.

BEE STINGS

Worker bees only sting as a last resort, because when they sting they die a grisly death lasting two or three days. Their venom sac and entrails are pulled away from their bodies as the sting and venom are embedded in the victim and continue to pump heat and pain for at least another 90 seconds. Beekeepers are known for carrying out-of-date credit cards which are handy to scrape out the sting from the surface of the skin.



The moment of birth for two worker bees (top left); queen bees marked with a colored spot; and a special beeswax cradle for a future queen (bottom right).

Society in the Hive

We humans have two castes or types within our society. Men and women are clearly identified by their different sexual design and behavior and even more clearly by the ability of women to bear children. In the hive there are three castes—alpha (queen), beta (worker) and gamma (drone) bees. Bees are born to one of these jobs and stick to it without complaint or competition with any other caste. You cannot climb the social ladder to become something better as a bee; you are what you are born to.

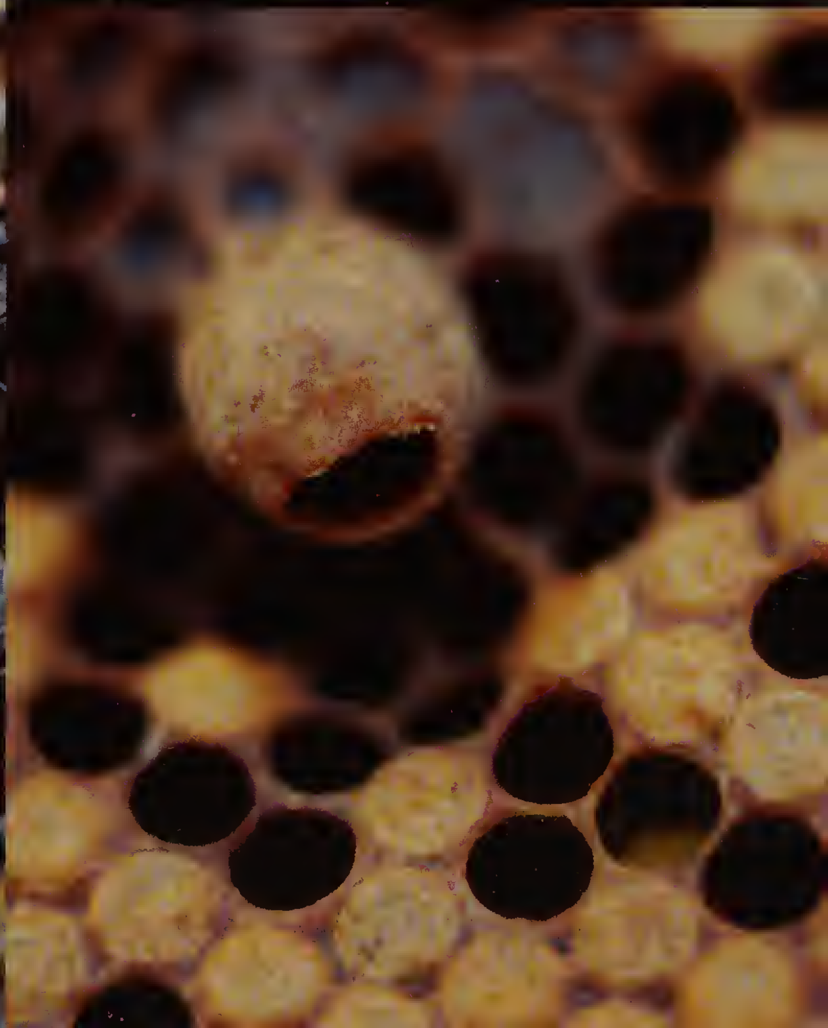
The alpha female is the largest, longest and most elegant of the bee castes: the queen bee. Female sexual activity is strictly for reproduction in the hive—one queen per colony is selected for this purpose and her sexual activity restricted to a few moments in one day in her life. The queen bee is fed throughout her life on royal jelly, which makes her extremely fertile and extends her life span to three or four years. She will see out all the other members of the hive many times thanks to the rejuvenating properties of this royal food.

The rest of the females—approximately 50,000 of them—are beta females, known as worker bees. They start life as a tiny egg, the size of a comma in this sentence, and after 21 days become of age and are born as a furry worker bee. They are born into slavery and are sterile, never to bear baby bees (except in highly unusual circumstances) or be distracted from their frantic daily labors by sex. Instead, they devote themselves to the future of the beehive as a super organism. Worker bees are conditioned to be obsessive about the economics of the hive—honey and pollen storage—while slavishly undertaking every menial task needed of them hour after hour without retaliation or reward. The workers are the backbone and soul of the hive—one might say that they are typically female in that they multitask, are flexible to changing situations minute by minute, and end their short life of six or seven weeks without the rest of the hive's inhabitants noticing or expressing gratitude. Worker bees are the unsung heroines of honey.

The male bees, all 500 or so, are drones, with larger bodies and more monstrous eyes than the female workers. Their ambition in life is simple: to have sex with a virgin queen. Drones are the lounge lizards of the hive, the freeloaders of bee society. Idle and unresponsive to the daily needs or the workings of the hive, they pander to the worker bees on whom they are totally dependent. Drones, or fertile males, do not have a tongue capable of collecting nectar so they simper to the workers who almost hand-feed them on demand throughout the summer months. Yet the bristling beehive seems to thrive better with them about: their presence seems to ease and relax the whole hive—but not for long.

As the summer months fly by, the queen starts to look worn and tattered, and as her queenly pheromones slowly dry up, the workers conspire to raise one or several new queens. Unlike in our own royal family, queen bees are not born from a lineage of queens, who themselves are descended from ancient royal bloodlines, but share their descendants with worker bees. New queen bees are made hot off the press from humble worker bee eggs. Before the monarch is driven from the parent hive in a swarm, the old queen will have laid thousands of eggs destined to become female workers. Behind her back several of these eggs will have been selected to become queen eggs. Only one egg will survive, chosen by the adult worker bees to become their next queen.



They prepare an intricate wax cradle fit for a queen—a huge cell resembling a peanut shell. The tiny young baby grub is not fed as other worker grubs (larvae). The queen larva is fed exclusively on royal jelly secreted from glands in the jaws of young worker bees. Not for her a short life of drudgery like them—her long life is now assured. The worker egg develops into a new virgin queen thanks to this royal jelly, which somehow affects the bee's genetic makeup and disrupts how her genes express themselves within her cells.

Within days of hatching, the new virgin queen will be persuaded by the workers to take her "nuptial flight." There is no peace until she obeys. She will soar high into the air and here meet congregations of waiting drones. For centuries, drones have been known to meet in definitive places and referred to as congregations, as at a church wedding. The virgin queen mates with up to 40 suitor drones in the air—10 to 14 will be successful in discharging their sperm to her for life. She will store it for the next three or four years. Her single day of sex is over. Nature has ensured a wealth of variety of sperm and the fittest have passed on their genes. This is not only the queen's final sexual act, it is the drones' too. They die soon afterward: penetration with the queen has ruthlessly ripped out their sex organs. But the future of the beehive and a new generation of bees is assured.

After mating with the queen, 490 drones remain—but not for long. Sad days await the unfulfilled and unsuccessful drones back in the hive. There are too many of them. They will consume the precious reserves of winter honey if they are allowed to stay and live. The slaughter of the drones commences, with hundreds strewn pitifully outside the hive. The workers cease to hand-feed their brothers, starving them out. Helpless, the drones attempt to re-enter the hive. Again they are expelled and hauled away from the hive, their legs becoming dismembered and wings battered. They are left to die a grisly death.

There is no sentiment in the beehive; bees are judged on their function and any bee is dispensable if it does not perform. The slaughter of the drones starts earlier every year. I remember (even 15 years ago) it being in September in the UK—it now begins at the end of July. Weather patterns and nectar supplies are changing and the bees are the first to adapt.



BEE DRINKS

If I want a drink I turn on the tap, but what can bees do in a drought or when water is in short supply? Never underestimate the amount of water that a hive of bees requires. However, if the water source is too deep, bees will drown. I keep some old stone troughs and birdbaths as bee drinking stations, layering the bottom with small pebbles and covering them halfway with moss. Do something similar and you will be able to watch bees land and suck water from the moss for several minutes.






Flower Power

Bees are totally dependent on flowers, from which they sip liquid food, or nectar. They owe their existence to flowers, and though they don't demand gardens of Eden to thrive, their very survival has depended—and now depends more than ever—on there being a wealth and diversity of flowering plants, weeds and bushes and tree gums and resins. The changes in our countryside over the past 50 years—the avalanches of liquid concrete or decorative gravel and the decline in flowering meadows that provided precious habitats for insects and birds—has been the sword of doom for our bees.

But although dwindling, there still exists a veritable cornucopia of flowering plants out there, luring bees with their artist's palette of colors and array of perfumes. Flowers cannot move, but those that need to be pollinated by honeybees outstretch their flowers and leaves to attract bees, ensuring pollination and their own survival. With outrageous exhibitionism, pollen and nectar from all kinds of flowering plants willingly yield themselves to honeybees. Plants seduce honeybees with their favorite cocktail: a nectar drink that oozes from the flower's deep center. The thin sweet liquid is the honeybee's lifeline.

The flower has a cunning strategy up its sleeve: as the bee squeezes its delicate body inside the petals to get to the nectar, it wades through a snowstorm of pollen grains (the sperm of the plant world). The electric charge of the bee's hairs directly attracts pollen, which inevitably sticks to them, ensuring pollen collection and delivery to the next plant in one swoop. The bees fly back to the hive covered from head to sting with brightly colored pollen grains gathered from as many as 100 flowers of the same species on a single journey. By visiting so many flowers, they guarantee that pollination of next year's crop of apples, pears, cherries, almonds, squashes, watermelons, nuts, cotton and canola is underway.



Install a bee drinking station in the corner of your garden and surround it with a host of wildflowers and the bees will flock to it.

Back they head with first-class food for the beehive. Nectar is precious to all bees—it is an instant energizer and the prime food of the beehive's winter pantry. Now the miracle of honey-making can begin.

Wherever a hive is placed—in the countryside, a semi-suburban area or within city limits—worker bees will search out flowers for their sisters and their hive. Indeed, much publicity has been given to beekeeping in cities. At first glance this should be applauded and supported. After all city streets hold the heat of their busy roads and tall buildings long into the night and the following day, with the bonus that plants flower one or two weeks ahead of their country cousins. Consequently flowers in city parks, esplanades and baskets hanging over busy thoroughfares are magnetic to bees. But no one has analyzed the particulates—super tiny particles of carbon laced with poisons like lead—in city honey, or worse still in pollen and propolis, for the latter are tremendous barometers for pollutants. It could be worryingly high.

TIPS FOR A BEE-FRIENDLY GARDEN

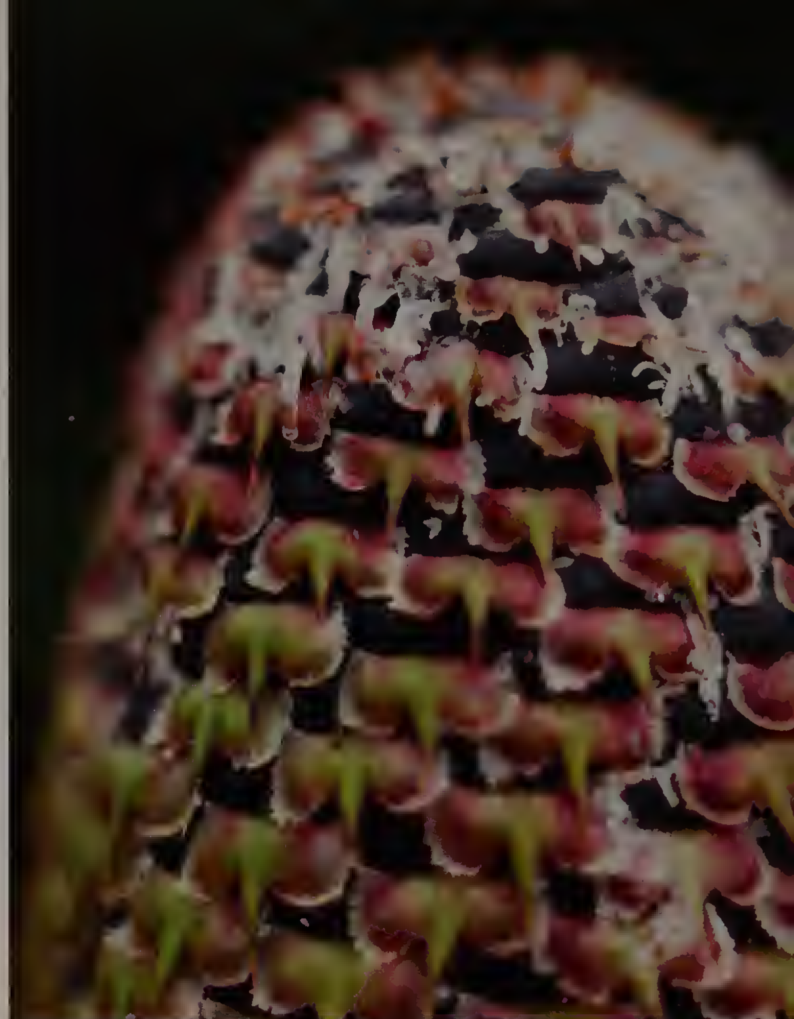
Do you want to make the natural world more bee-friendly? The best place to start is your immediate environment—why not begin with your back garden?

- Brighten up your garden with bee-friendly flower seeds. Plant the following in your garden, patio pots or window boxes to provide essential nutrition for bees:

Aster	Borage	Lavender
Alyssum	Candytuft	Marigold
Basil	Catmint	Poppy
Buttercup	Chives	Rhododendron
Butterfly weed	Clover	Sage
Calliopsis	Dahlia	Sea holly
Coneflower	Daisy	Sunflower
Coreopsis	Goldenrod	Zinnia

- Allow a patch of grass to grow long and densely plant an area of a border to provide bees with shelter from the rain or a sudden drop in temperature.
- Reduce the use of pesticides in your garden—the widespread use of pesticides has been implicated in Colony Collapse Disorder (CCD), where whole hives have been found abandoned.
- Bees need water—place pebbles in a shallow dish of water and you will be bombarded with bumblebees and honeybees after a few days. Keep it replenished and they will keep returning: bees have good memories.

The big ooze—antiseptic gums and resins are avidly collected by our bees.





Masterstroke of Nature

The spectacular marriage between honeybees and plants can be seen in action here at our Honey Trail at Troway Hall in northeast Derbyshire. Much of the goodness of the land for bees is a result of neglect by past owners of the land—this has ensured that so much remains unchanged. The riverside meadows, for example, are among the few surviving entire hay meadows left in England and contain more than 200 species of wildflowers. They have been declared Sites of Special Scientific Interest (SSSIs), and their well-being is overseen by the conservation body Natural England. Ninety percent of hay meadows have been lost forever.

Further acres have been put down to fir and spruce trees to sell for Christmas; they abound with weeds and wildflowers, a kaleidoscope to behold. The surrounding hedgerows are up to 23 feet (7 m) thick, made up of more than 12 deciduous species, and have probably yielded up flowers, fruit and berries for several centuries. We never look where the bees are foraging; we can tell simply by listening to their contented hum far in the distance.

The jewel in this glistening crown for wildlife must be the antibacterial honey produced by the symbiosis between our natural environment and bees. The thousands of Christmas trees exude exotic smelling saps and resins toward the end of summer. The bees go mad for these gums and they leach into the honeycombs and the honey within them. The resins also swiftly convert to propolis—the top bee product for antibacterial and antioxidant power. This antibacterial and medicinal honey is the gift from nature for the way Troway Hall has been and still is managed.










CHAPTER TWO

Honey

Glistening fresh honey reveals itself under its weatherproof protective layer of beeswax.

The miraculous nature of honey is reflected in the mythology that surrounds this sweet, sensual syrup and its creator, the honeybee. In the ancient Greek world honey was described as food of the gods, and in the folklore of many cultures it promises long life and represents good health and sweet prospects. Honey also has religious associations—it was reputedly the first and last food that Jesus ate and in the Koran is said to be the remedy for all illnesses. Throughout the world honey symbolizes optimism, purity, well-being and goodness, while the hive is a symbol of industry, purity and the perfection of coordination.

Honey has also always been hailed as "the universal healer" and revered for its life-giving properties. The medicinal use of honey can be traced back to the ancient Roman, Greek and Chinese cultures. The Chinese have always classified honey as medicine and still do, advocating its daily use to ensure good health and vitality and as the springboard to a healthy and long, long life. After all, long life depends on one fundamental—the ability to withstand infection and disease, and honey certainly boosts immunity and has preservative properties.

But ask most honey addicts why they love it and they'll find the question difficult to answer. Love of honey is part of our human history, defined in our genes as mammals. From bears to badgers to humans, mammals demonstrate an innate instinct to hunt out honey, developing a taste for sweetness from infancy. Indeed, it's our driving force from the moment of birth. The taste of the milk-sugar lactose welcomes us to our mother's breast, forging a deep connection between sweetness and our survival as a species. Later in childhood we taste honey—and from then on Mother Nature's irresistible cocktail has us hooked.

A Brief History of Honey

Bees have watched the evolution of our own species without changing much at all—indeed, we might say that in honey we can trace the history of mankind. Can you believe that a bee trapped and captured in golden amber (the sticky resin that entombs and preserves insects) dating back some 30 million years has identical features to a modern bee? It has six visible segments and the "feelers" or antennae have the same number of joints. The handy pollen carriers or baskets on the bee's back legs are also identical to those found on bees today.

The oldest evidence of man collecting honey is to be found in a prehistoric painting found in caves near Valencia, Spain. Painted in red, it is thought to be some 15,000 years old, originating in the Stone Age when in order to find shelter from predators, mankind might have lived in caves.

The use and enjoyment of honey predates civilization, but once human society began to develop the bee was adopted as a sign of mankind's ingenuity. As long ago as 3,000 BCE, the bee was adopted as the hieroglyph of the rulers of Lower Egypt and carved on tombs of innumerable pharaohs as a never-ending symbol of power, industry and production. The erudite Egyptians also used honey as currency—honey was money.

Honey comes wrapped in the most beautiful beeswax, which can preserve it for seemingly endless years; the Romans, Egyptians, Babylonians and Arabs used beeswax and honey for embalming their loved ones and leaders. Even in England, when Edward I died in 1307, then was exhumed in 1774, his hands and face were found to be unbelievably preserved—as they had been purposely coated with a brushed layer of honey.

The pages of historic texts demonstrate the place honey has occupied at the epicenter of governments,






Honey gives amazing moisture to cookies and cakes and extends their shelf life too.

A great tip, when spooning out honey, is to coat the spoon in the thinnest layer of olive oil (or similar), and the honey will simply shoot off the spoon.

healing systems and religious ceremonies, providing the elixir of rites of passage such as birth, marriage and death. The Jewish New Year, Rosh Hashanah, delights in dipping slices of apple in honey as fruitfulness for the incoming and unknown year ahead. The Romans not only paid their taxes in honey, they also consumed mountains of honey-saturated food and drink at the grand gatherings and colossal banquets held to celebrate the harvest, especially of apples, wine and honey. Meat was marinated in honey and flavored with honey mustards and sauces, while the energy drink of the day comprised fruit juices drenched in honey that guaranteed an immediate surge of energy through the bloodstream. At wedding banquets the fruit and honey cocktail "a la Rome" went a stage further, being laced with poppy extracts to excite mind and body to a frenzied state of euphoria. No wonder the newly married couple were in a state of connubial exhuberance as they left the wedding breakfast for their new life!

Honey is a superlative addition to cakes and pastries—moisture-laden sweet crumbs of heaven hit the tongue—and saves endless time slaving away in the kitchen, as cakes baked with honey will stay fresh for a few weeks if stored in an airtight container. Honey extends the shelf life of cookies and energy bars and has always been used on expeditions and long journeys because it packs a great energy boost and keeps food fresh and appetizing for much longer. Honey cakes are a must if sending cakes by mail to all corners of the globe. Great for our Armed Forces serving abroad.

I have to admit that heating honey affects its enzyme activity, but adding honey to sweeten tea and coffee is a norm here at Troway—giving a lovely hint of cognac without alcohol, if you choose a good flavored honey, such as chestnut, antibacterial or heather honey.

Honey in Cooking and Baking

Honey is sweeter than sugar, so prepare yourself to use less honey, weight for weight, when cooking than you would if using sugar alone. Use the minimum measure of honey to sugar.

Second, honey is a liquid and a preservative at the same time. You will need one-fifth less water in your baking, to ensure that the mixture does not resemble a disastrous baked gloop.

Cooking Meat

Honey adds more than a dash of color to roasted meats and baked hams; it crisps and adds taste to the beautifully browned outer skin of the meat—just think of crisp pork rind or crackling. You can rub honey all over pork chops before grilling. You can do it with salt or, as I do, use a honey glaze in a medium oven for 30 minutes at the end of cooking time.

I actually use mustard and honey together for the best crackling on hams and pork. Rub this mixture over newly cut diamond score marks in the meat 30 minutes before





the meat has finished cooking. Bake at 425°F (220°C). Make sure the outer skin does not burn for the final 30 minutes.

Stuffed shoulder of lamb will be far better in texture if the outside layer of fat is rubbed with honey and lemon. Baste with honey and lemon while roasting.

Honey mixed with mustard is also scrumptious baked over chicken pieces, whereas honey and mayonnaise is a perfect dressing on salads or just add a light brushing of honey on kebabs on the barbecue.

NOTE Never put your jars of honey in the fridge. Honey should be kept at room temperature—this will prevent rapid crystallization. The latter can be quite natural for honey over time, so sit your jar of honey in a basin of very hot water for 15 minutes and it will return to its liquid state. Alternatively, remove the lid from the jar and put in the microwave for 15 seconds. Repeat if necessary.

The Hurried Beekeeper's Standby Dinner for Friends

Chicken and Apples in Honey Mustard Sauce

Serves 4

1/2 cup (125 ml) apple cider
1 1/2 teaspoons (7 ml) cornstarch
1 tablespoon (15 ml) mustard
1/4 cup (60 ml) honey (or more according to taste)
pinch of salt
freshly ground black pepper
2 tablespoons (30 ml) seasoned dry breadcrumbs
Four 4-ounce (115 g) chicken breasts
1 tablespoon (15 ml) olive oil
2 small unpeeled baking apples, cored and sliced
1/2 cup (125 ml) chicken stock
handful of freshly chopped chives, watercress or parsley

1. First make the cider mixture as follows: whisk the cider, cornstarch, mustard, honey, salt and pepper (to taste) in a bowl. Set aside.
2. Put the breadcrumbs in a bowl and lightly coat chicken with crumbs.
3. In a large nonstick pan, heat the oil and add the chicken breasts. Cook over medium heat until golden brown on one side, about three to five minutes. Turn the chicken, add the apples and cook until browned on the other side.
4. Add the chicken stock, cover and simmer until the chicken is tender, about 15 minutes.
5. Carefully remove the chicken and apples to serving plates. Whisk the cider mixture again and add to pan.
6. Cook over high heat, stirring until lightly thickened and sizzling hot (this usually takes just one to two minutes). Spoon over chicken and apples. Sprinkle with chopped chives, watercress, parsley or herbs of your choice.
This works well served with rice or pasta.

Desserts

There are so many desserts with astronomical calories, so why not use raw honey instead as a great energy and essential bioactive boost? You can keep it natural and serve with fresh fruit to add to the already high bioflavonoid content of your honey. Prepare clementine or orange segments and a few raspberries, strawberries, grapes and pineapple pieces and finish off with a honey drizzle. You could also add a scoop of ice cream or sorbet per person. I could live on this fruit frenzy forever.

Baked Energy Bars

1 1/2 cups (375 ml) honey
3 tablespoons (45 ml) butter
3/4 cup (180 ml) superfine sugar
1 pound 5 ounces (600 g) plain flour
1 teaspoon (5 ml) baking powder
1/2 teaspoon (2 ml) baking soda
1/4 teaspoon (1 ml) ground ginger



2 teaspoons (10 ml) ground cinnamon
pinch of ground cloves
1 1/2 ounces (40 g) chopped almonds
2 ounces (55 g) candied cherries, chopped
2 ounces (55 g) candied orange peel

1. Preheat the oven to 350°F (180°C). Melt the honey, butter and sugar together in a large saucepan.
2. In a separate bowl combine half the flour, the baking powder, baking soda and spices. Mix well.
3. Add the melted butter mixture to the dry ingredients and stir well. Stir in the candied fruits and almonds with the remaining flour. The mixture will be very sticky; to add a little more moisture, mix in 2–3 tablespoons (30–45 ml) of honey.
4. Spoon into 2 baking trays and bake in the oven for 30 minutes. Remove and cut into squares. Leave to cool—the squares will become soft and chewy. Store in an airtight container to keep as treats for weeks to come.

Honey Biscuits

4 tablespoons (60 ml) butter
1 cup (250 ml) all-purpose flour
1/2 teaspoon (2 ml) baking soda
1 tablespoon (15 ml) hot water
2 ounces (55 g) golden raisins
1 cup (250 ml) honey

1. Preheat the oven to 350°F (180°C). Mix the butter and flour together in a bowl. Dissolve the baking soda in hot water and add to the butter and flour mixture. Then scatter the raisins into the mixture and stir in thoroughly.
2. Pour in the honey gradually and stir until you have a firm dough.
3. Roll out on a floured board to approximately 1/2 inch (1.2 cm) thick. Place in a greased pan and score the top of the mixture into squares with a sharp knife.
4. Bake in the oven for 10–15 minutes. Leave to cool then divide into squares.

Energy Source

Two thousand years ago, Greek athletes would stuff themselves with honey throughout their training for the great Olympiad (now the Olympic games), aware that it could boost their energy and performance levels. In the 20th century, Alpine climbers consumed huge quantities of honey before undertaking dangerous climbs, while long-distance swimmers did the same from the 1880s to boost their energy reserves and powers of endurance before attempting to swim the English Channel. Remember that Sir Edmund Hillary as part of that duo Hillary and Tenzing, who conquered Mount Everest in 1953, came from a beekeeping family in New Zealand and put honey at the forefront of his daily training and endurance regime. Many references, worldwide, place honey at the center of training and performance. Honey is the ultimate sports beverage as it significantly reduces the time of cycling trials over 40 miles (65 km), with a commensurate surge in body power, giving those who took honey and glucose (rather than other leading brands of power drinks) a three minute overall benefit in the finishing time (University of Memphis Exercise and Sports Nutrition Laboratory). This statistic gives athletes taking honey the edge—and always has, as when Man escaped from predators or needed extra nimbleness to catch his prey.

In 1937, the wreck of the ocean liner RMS *Lusitania* was sought by deep-sea divers off the west coast of Ireland—she had been sunk by a torpedo from a German U-boat in 1915 on her journey from New York to Liverpool. This was one of the most dangerous wreck-recovery operations ever attempted, and the men selected were the pick of undersea crews worldwide. The Atlantic waters would have been near icy and the divers' body temperatures would have plummeted from the norm of around 98.6°F (37°C) to as low as 84.9°F (29.4°C), resulting in violent trauma to the body, which easily could have been fatal. The divers spent six months in preparation for this great adventure, gradually

incorporating extra amounts of honey into their daily rations until, three weeks before the dive, they were each eating 1 pound (450 g) of comb honey for breakfast. It was well known then—as it is today—that large quantities of honey are useful for oceanic exploration because honey contains glucose and fructose, which produces tremendous reserves of glycogen in the liver. The all-important consideration in any feat of endurance is to maintain blood-sugar levels because those with the best stores of glycogen and blood sugar will always emerge from such feats and races against time as the least exhausted and last to be fatigued.

Honey was not restricted to maritime use in World War II. During the early days of the Battle of Britain, young and "green" Royal Air Force (RAF) pilots were fed huge amounts of honey as part of their diet and, more important, on returning from each mission. When in their planes the pilots would be traveling up to $7^1/_2$ miles (12 km) above the earth at a temperature of 5 to 10.4°F (–15 to –12°C). In these conditions the human body cannot survive without an adequate oxygen supply or body temperature. The pre-imbibed honey provided controlled blood energy to the brain and body while the honey and warm water elixir back at base helped pilots make a speedy recovery and avoid battle fatigue.

HONEY FOR THE BRAIN

Whether you live life at full stretch or are more relaxed by nature, having a spoonful of unprocessed honey before bed can support your brain function. The fructose in the honey is stored as energy reserves in the liver, ready to fuel the brain overnight. Brain activity doesn't stop when you sleep, it is constant and so requires a continuous energy charge. The honey provides this so that you wake feeling refreshed.

Why has honey been successful in boosting the endurance of adventurers and athletes throughout history? Because of the consistent fuel it provides from fructose stored in the liver and made available through sugar in the blood. Bees too are fueled by fructose, and it is this that allows them to travel enormous distances at high speed and in perilous conditions, assaulted by high winds, fluctuating temperatures and rainstorms. When airborne, bees fly at a maximum 15 mph (24 kph) and they don't take the "scenic route"; they know where they are going and fly direct from beehive to food source and back, giving us the phrase "a bee line." I have known bees to travel up to 10 miles (16 km) on a round-trip—almost double the distance stated in many books. Like the young RAF pilots, they use honey to elasticize their normal energy reserves. Research in the 1970s compared two batches of bees and their feats of endurance. Batch one were fed on glucose and fructose in equal proportions. Batch two were fed on glucose only. The first batch flew twice as far as the bees in batch two and completed their activity in half the time of their sisters. The fructose and glucose works for bees—and indicates the important role fructose can play in our own bodies, too.

Raw Honey

The taste of raw honey has an energy and freshness all its own, so why settle for less? Unfortunately, you may have to if you shop for honey in a supermarket. Real honey—the honey that my family and our customers have been brought up on—is seldom found on supermarket shelves. Real honey is raw and never filtered, super-filtered or, even more brutally, ultrafiltered. Supermarkets love ultrafiltration, which is applied to foods including beef, chicken and fish, too. Not only does ultrafiltratrion remove pollen and the residues of honey, which would pinpoint the origin of this type of honey—it could also be a loophole to the non-detection of the source and country of origin. All manufacturers of animal products love





ultrafiltration. In the first stage of this process, the food is heated to around 160°F (70°C). This heat treatment keeps honey beautifully liquid in its jar on the shelf, glistening with a "pure" honey color forever and a day. If this were not bad enough, the honey is then blasted through an exceedingly fine mesh, which ensures that not one grain of pollen survives. In so doing, the precious enzymes, vitamins, antioxidants and antibacterials in the pollen are eliminated—all the extra-nutritious properties for which honey has been celebrated since ancient times. Pollen has an unbelievably high vitamin C content—far higher than fruits or vegetables—and this does not decline during storage, whereas vegetables can lose up to 50 percent of their vitamin C within 24 hours. But in a study, ultrafiltrated honey showed little or no vitamin C. When raw, unfiltered honey was tested (containing plenty of pollen), it was found to be high in vitamin C.

So ultrafiltrated honey is denuded, transformed into a super-heated, good-looking sugar syrup. You may have been lured by the glossy jar and the green-looking label, but honey without pollen is much like a river without water. Look closer at that jar of supermarket honey—does the label state that it is organic? It is an even bet that this has been super-heated too and ultrafiltered for convenience of bottling and packaging—because it stays liquid forever in the jar. The word "organic" is no guarantee that a jar contains real, raw honey as nature intended.

If you have had the pleasure of extracting honey from the comb you will know that it is likely to contain particles of beeswax, globules of propolis and probably the odd bee's wing or leg. These are best strained out using a wide stainless-steel mesh—never filtered. What heaven it is to witness luscious golden honey in its unadulterated state ready to be bottled just a few hours after being collected from the hive. Relish the rivers of honey running through the mesh in the photograph opposite—it is literally raining natural honey. Honey in jars just as the bees made it looks and tastes wholesome and is the best thing for our health.

CRYSTAL CLEAR

In 2009, I was asked to give the Blaxland Memorial Lecture at the National Honey Show in Weybridge, Surrey, the annual venue for beekeepers from around the world. Hundreds of superb, crystal-clear jars of honey were on show, ready to be judged by the top honey judges of the day. You could feel the tension in the air. At honey shows, reputations can be thrown away by the most trifling inattention to the rules. These honeys had been unstintingly filtered by their respective beekeepers so that the finished jar of honey was dazzlingly clear. Clarity and unblemished honey would grab the top prize. At the end of my lecture, I suggested—no, demanded—that next year the show should encourage honeys to be judged on their natural ingredients and antibacterial activity—and be submitted with scum, pollen and resins not filtered out. The sponsor of the lecture, Richard Blaxland, past master of the Worshipful Company of Wax Chandlers, gave a toast, "To honey with the good bits kept in!"

Honey for Eternal Youth

Beekeepers across the globe enjoy raw honey throughout the day—for breakfast, as a snack, before bed—not only because it tastes like the breath of heaven, but because many of them consider it the most effective death-defying elixir of all time. Many of the great beekeepers of history lived to 80, 90 or even more than 100 years. The Greek philosopher Pythagoras (c. 570–c. 490 BCE) is said to have breakfasted on honey and fueled his contemplation on a mix of legumes and seeds pounded to a paste with honey. Hippocrates (c. 460–c. 375 BCE), the father of modern medicine, is reputed to have eaten honey daily and used it to treat sores and chancres (syphilis to you and me). For me, the golden rule of a long life is a minimum 2 or 3 teaspoons (10–15 ml) of raw

honey per day, as part of a diet based on eating simple, natural foods in moderation.

In the 1980s, the Finnish biologist Dr. Paavo Airola (1918–83) conducted a survey of some of the oldest people on earth. He wanted to learn their secrets of longevity: what did they eat and how did they live their lives? Dr. Airola isolated five factors that seemed to have an influence on the life span of his subjects: they lived at high altitude and led an active life, which strengthens the heart and improves stamina; they avoided processed foods (and therefore consumed no additives or preservatives); they followed set routines and as a result experienced little stress; and they tended to be in positions of authority (and so were well-read and took advice). Interestingly, 75 percent of the long-lifers he identified named honey—raw, unfiltered honey—as one of their key daily foods. In fact, these veterans were rather cute: many were beekeepers who sold the clear honey from their hives (what the public wants) while scavenging from the residue to enjoy for themselves—the mix of pollen, wax, propolis and honey that had built up in the base of the hives, considered the dregs by everyone else. It seems that these residues are the crown jewels of the hive, rich in amino acids, minerals, bioflavonoids, vitamins and the "dynamic duo" of fructose and glucose (see page 66).

All the long-lifers in Dr. Airola's study were exponents of bee pollen, whether taken alone or in the honey collected from the beehives. Supermarkets insist that honey is crystal clear and stays that way: no pollen, no wax, no propolis and absolutely none of the natural beehive residues that may contribute to a long and healthy life.

Types of Honey

Every region is home to a unique blend of natural wild flora and crops under cultivation—according to what best suits the climate and geographical situation. This is reflected in the honey created by the bees in that location. The different plants show up in a kaleidoscope of colors and aromas in the honey, which are characteristic of the type of blossoms and flowers the bees have been gorging on—for example, some minerals in the soil influence the nectar of the plants and the consequent color of the honey.

A honey connoisseur can detect the honey type as soon as the jar is opened. It is at this moment that the aromatic flavors crash through the smell barrier, stimulating our never-ending cravings! When I taste our different honeys throughout the year the sensual hit of orchard blossom, dandelion, wildflower, hedgerow plants or heather assaults every taste bud, making them easy to identify. Here is a simple guide to some common types of honey. Whatever its floral source or texture, do seek out raw, unprocessed honey.

Acacia honey

(Hungary) Some people find this light-colored, clear honey delicately flavored; for others it seems a little bland. But the big plus is that this honey stays liquid almost for eternity. Good with fresh ricotta cheese.

Canola honey

(U.S., Canada, UK and Europe) In spring, the fields of electric-yellow canola blossom send the bees delirious—I wish they wouldn't. Canola honey's great drawback is that it sets like concrete in the honeycomb if you do not check the hives almost daily. In any event it crystallizes quickly in the jar, and for this reason canola honey is "creamed" to make a soft set honey. This means that the beekeeper has to whisk air into the honey to keep the final product looking pale and creamy. This has a handy consistency for those who tend to spill runny honey.

Orange blossom honey

(U.S. and Europe) This honey is easily identified by its rich amber color and tangy taste, and it retains its runny state for some time. As well as being delicious over yogurt, this honey is also good for flavoring crispy duck.







Borage honey

(UK) Not easy to find, but worth hunting for because this light-colored honey has a deeper taste than acacia honey with a fresh sparkle of the countryside. It stays runny for a considerable time. The Romans loved borage honey—in fact it made them so cheerful in heart that they named it "happy honey." Excellent with fruit and raisins over ice cream or morning cereals.

Lavender honey

(Provence, France) Rich, dark and aromatic, lavender honey tempts most of the senses and is truly the connoisseur's taste—to others it can seem perfumed in excess. Excellent over roast lamb and irresistible on warm freshly baked croissants.

Hedgerow honey

(Worldwide, from selected beekeepers and suppliers) A vital honey with rich, deep and often varying tastes because of the variation in hedgerow plants from year to year. Our hedgerow one year can have a huge amount of hawthorn, for example, and the next year none. Mind-blowing with fresh bread and cheeses.

Hawthorn honey

(UK and Europe) Trumpeted in folklore for relieving hypertension and palpitation of the heart—and one lady I know declares it is responsible for her amorous disposition! Has a hearty mature taste with a fresh tingle as an aftertaste.

Wildflower honey

(Worldwide—but species will differ according to weather and soil conditions) Difficult to track down locally because so many wildflower meadows have been torn up and replanted with monoculture crops. Obviously the taste varies according to the flowers in bloom at particular times through the spring and summer. When meadowsweet is in full bloom in our hay meadows, the aroma of millions of flower heads is deeply heady and sweetly honeyed, which translates into a sweet but fragranced honey. Difficult to source, but difficult to refuse at the table.

Tupelo honey
(U.S.) From the swamplands of northwest Florida, this lovely light honey has a deep, mellow taste, and you challenge it to crystallize. Collecting the honey is often a dangerous task because the beehives stand on platforms supported by stilts above the waterways and swamps. Beekeepers float by on barges with arms outstretched for collection. Excellent on hot buttered toast or ice cream. Tupelo honey is a thinner honey—so be careful not to wade elbow deep in it.

Heather honey
(Scotland and parts of UK) Reflecting the color of heather, this strong honey is not for the novice. Surely tops in worth, taste and nutrient content. Heather honey is so, so different from any other because it is never liquid and seldom solid. This darker honey shines an iridescent ruby color and is almost jellylike. It cannot be extracted from the honeycomb in the regular way (see page 60). Our bees travel around 2 miles (3 km) to forage on heather in August and September. They must get a buzz from heather because they do not cease foraging for it until past dusk, gorging on the tiny purple flowers until the hives are brimming over. Other hives are placed carefully out of the wind but close to the heather to save the bees time and energy. Heather honey is one of the best for medicinal use, being saturated in minerals as well as high in antibacterial activity. I think heather honey is best bought in the comb, when the beeswax has a strong laxative effect (see page 65). It also has a soothing and soporific effect at bedtime. This honey is superb on scones and oatmeal.

Sweet chestnut honey
(Southern England and Europe) Claret colored with a taste to knock your socks off. Dark and searching flavor with a slightly burnt taste. High in antibacterial content—fabulous with fresh figs and tangerine. Use lightly.

Balsam honey
(UK and northern Europe) Collected by bees at the water's edge on most occasions. Bees visiting balsam look as if they have been through a snowstorm—covered in pale white pollen. Having a taste to match its light color, balsam honey will refresh stir-fries and curries and is sumptuous on chocolate or fruity ice cream or yogurt.

LIQUID HONEY

All honeys are of a runny consistency to begin with, but they crystallize quickly when rich in glucose. Honeys with a higher proportion of fructose remain runny for longer. If the honey is crammed to bursting with pollen, it looks cloudier—this is the bee's knees of raw honey. It is perfectly natural for honeys to granulate over time. There is nothing wrong with this and it is very easy to melt them out. Just place the jar in a bowl of hot water or remove the lid and place in the microwave for two minutes (on low). Presto—one perfect jar of re-liquefied honey.

The Color of Honey

Have you asked yourself what is meant by honey colored? We yearn to be surrounded by the warmth of the natural color of honey, and use it to describe everything from an article of clothing or the color of paint to delicious-looking food. However, I am unable to describe the color of honey, because for me as a beekeeper it crosses the entire spectrum—honey can be white or yellow, light to deep orange, pale to deepest ruby red or even green.

Honey connoisseurs are akin to wine tasters; they know what they like just by the aroma and texture or by the color. The lighter honeys (such as borage, balsam and acacia) have a fragrant and delicate flavor, whereas darker honeys (such as heather and chestnut) have a strength of





flavor and richer depth about them. In general, the darker the honey, the higher the bioflavonoid content and therefore the greater the antibacterial effect (see page 70). On the whole, the darker the honey the higher the mineral content, too. When you next feel under the weather, treat yourself to a naturally darker honey to inject a boost to your immune system.

It is important to be wary about the type of dark honey you consume. Natural raw and unprocessed honeys are never subjected to heat; this preserves all their natural nutrients and medicinal properties. Honeys that have been heated or put through extreme processing procedures (see page 48) will be darker in color but may have lost some or most of their intrinsic bioactivity. Overheated honey has fewer medicinal qualities.

From Hive to Jar

How do the bees sit on the jars? I remember being cross-examined by a 6-year-old about this very topic. She is not alone in thinking that bees perch on top of jars and dribble their honey in, ready for us to eat. I wish it were that simple! Bees store honey in their own ready-made beeswax cells supported by a wooden frame (see page 18). Beekeepers supply the basic wooden structures—the top box of the hives is where the bees deliver their nectar to be converted into honey—and the honeybees do the rest, or should do.

Bees do not collect honey from flowers, they collect nectar, which is almost water-like in consistency. They can travel up to 5½ miles (9 km) there and back to harvest the nectar, though in reality they seldom travel so far. Once the watery nectar is back in the hive, it will be swallowed and regurgitated by thousands of bees within the honeycomb over a few weeks. This reduces the water content and thickens the liquid into a syrupy texture—honey.

The nectar collected from flowers by the bees comprises more than 80 percent water—but not for long. Repeated regurgitation by the bees is accompanied by energetic water evaporation by an army of fanning wings. This results in a product containing only 19 percent water. A low water content results in a honey which will last almost forever. It is sterile.

Beekeepers have to learn the language of the hive—the bees tell us when the honey is ready. If it is still too watery, the bees will not cover the honeycomb in wax, knowing that they have more work to do. If collected in this unripened state, honey will eventually go off or ferment after a few months. Look at the unripened honey glistening in the comb. Honey in this state needs to be returned to the hive to mature for a little longer.

At this point the bees turn on their automatic air conditioning by fanning their wings, causing a stream of fast-moving air to flow through the beehive over the unripened honey. As the water evaporates, the ingredients in the honey become more and more concentrated. The result is thick golden honey. A rippling blanket of pure white beeswax is then applied over the top of the honey to preserve every hexagonal cell in the honeycomb. This shows a first-class product, mature and preserved in beeswax.

Green and Unripe

Sometimes unripened honey does get into jars through unscrupulous honey packers. I doubt you would detect that the finished product had been derived from thin, unripened honey (known as "green" honey in the trade) because the adulteration and battering given this green honey will eventually result in a product that looks like genuine honey and will even pass a viscosity test. The thin honey is extracted and yet more water added, then the thinner liquid is rapidly evaporated until the finished "honey" does not breach the regulations if tested. (Thickened honey is generally allowed to be no more than 19 percent water.) It then goes on the shelves around the world.

Using "green" honey is a shortcut, saving time and making money without care for the finished product or the bees that have not been allowed to finish their precious prize. In the United States the permitted level of water in honey is 18.6 percent. Often genuine honey containing 13 or 14 percent water will be purposely watered down to redeem a greater volume of honey for bottling. Providing it contains no more than 18.6 percent water, it will pass the retail test. You will never know. This is why it's best to buy honey in small trustworthy stores or online outlets where you can talk to the person who handles the bees firsthand.

Regretfully, honey laundering is practiced worldwide thanks to the crisis of plummeting bee populations (see page 11). This has also resulted in rogue traders resorting to elaborate schemes to dump cheap imported honey on their home market, often describing it as home-produced on the jar. With bee colonies in decline worldwide, honey production in the United States, Canada and Europe has suffered and all are looking to other countries to supply their needs. For example, 112,000 tons (114,000 metric tons) of honey is imported into the U.S. every year, 40% more than the amount produced in the country. Unfortunately this throws the door wide open for rogue trading.

Honey is being shipped through countries to remove its traceability. Large shipments of contaminated honey from China, for example, are frequently laundered all over the world—many of the blended honeys on sale in the United States are a blend of U.S. and non-U.S. honeys, with the latter often coming from China. The trail leads through Russia, India and Australia, where Chinese honey-smuggling operations are rife. Singapore seems to be exporting extremely large amounts of honey, and yet has only a handful of beekeepers. Suddenly the Bahamas become a major honey producer, and yet when bees are moved there they die. The math simply does not add up.

Chinese hives have been treated with the antibiotic chloramphenicol to overcome rampaging infection. The resulting honey can carry traces of this antimicrobial, which is particularly worrying because China is the world's biggest producer of honey and in humans, traces of the antibiotic can cause bone marrow problems and worrying symptoms in pregnant women. In 2002, the EU banned the importation of Chinese honey temporarily because of this health risk. The US had already restricted honey exports from China for fair-trade reasons in 2001. But almost immediately, exports from nearby countries such as Vietnam, India, Malaysia and Thailand rose dramatically. It is difficult to investigate where honey comes from simply by reading a label. Seek out local producers, farm shops or small family farms where you know firsthand where your jar of honey (or any fresh commodity for that matter) has come from. Even Britain's biggest honey packer recognizes the problem of adulterated honey. Rowse UK gave an honest statement from its operations director, Brian Butcher: "The trouble is there are so many places in the world where people are selling dodgy honey. Once you spot a problem, it moves elsewhere."

Collecting Honey

Beekeepers have a real responsibility to capture the integrity of honey products as the bees intended. Using traditional methods of honey extraction is one of the best ways to ensure this. But that doesn't mean that honey producers have to revisit the days before electricity or labor-saving devices or work in muddy, damp barns.

At Troway Hall, we only take surplus honey from our hives. Honey is the bees' winter store and their survival depends on it. We work in a special building that won't allow bees in and have chosen to haul the honey boxes into the extracting area during the night. We never want to revisit the mischief from one year's harvest, when we extracted during the day. Masses of bees clamored outside the building wanting their honey back—or at least an unexpected banquet. We had to leave the building and abandon the extraction process until nightfall when we could proceed under the cover of darkness.

RESPECT TO THE BEE

Is your honey jar just about empty; are you about to throw it away? Please don't. Scrape it out once more. If you find only a tenth of a teaspoon of honey, you have made the life of the honeybee worthwhile—this amount represents the total amount of honey collected by one bee during her entire life.







Boxes and boxes of honey are collected from the hives throughout the day but left on trailers in the meadows and upper fields. The honeycombs have already been checked at the hive side—every frame is fully waxed and the honey is mature (see page 59). By nighttime only the odd bee lingers around the honey boxes and it is safe to move them inside. Nobody takes off their bee suit or veil until the honey harvest is safely indoors, and even then they do so warily. Extraction throughout the night ensures that masses of bees are saved and gives us a clear window to extract the honey in peace.

Running a knife under the wax on both sides of the frames makes honey spurt out and start to run down the frames. Each uncovered frame is then slotted nose-down into a spinner. Because the honey frames are heavy and often contain 4½–6½ pounds (2–3 kg) of honey, we turn on the spinner very slowly at first so that the nine frames do not smash or collapse under the force. Speeds vary, but soon we hear the honey splash against the inside of the round drum, slap, slap, as it hits the sides. It is a wonderful time of anticipation—what will the honey taste like? Will it all be the same color?

Frame after frame of honey is extracted in this way, and as honey fills the drum it runs toward the tap at the bottom. Beneath the tap are two strainers. One is coarse and one slightly finer to catch particles of wax flung from the frames, odd stalks of grass and any natural detritus that the honey could do without. The honey is run into tanks so that it can settle and any air bubbles rise to the surface. The almost clear honey then fountains from the tanks into sentry lines of white plastic pails.

Bottling and filling endless jars is an operation in itself. Some honey is fed through a closed system to the bottling machine. I relax, yet boast about this. For years we used to spend hours manually emptying each honey pail through a misbehaving round, wide tap. Volume has dictated this wonderful method, but the honey remains unchanged from before—raw and natural.

This miracle of nature can become overwhelming, with so many aromas, colors and tastes, all of them different. We work until most of the frames are empty, carefully placing the empties back in the boxes. These will be returned to each hive the next day still dripping in honey, since the bees love to lick them clean.

THE HONEY TEST

We are visited by trading standards officers from our County Council annually. The staff examine every batch, every lot number, and every best-before and expiry date in all our stock of honey jars. They allow us to state a best-before date of within three years of collection. We know that honey can keep superbly for up to 20 years without losing much of its aroma. Indeed, over the last few years we have enjoyed our mature honeys: they have a tremendous depth and mellow maturity of flavor on the tongue. Their smoothness lingers like a fine wine. Honey does not go off like other foods because it is acidic, high in sugar (which sucks out water from germs) and antibacterial, giving germs the boot. If the germs cannot survive in honey, then the product can never go off. All our honeys are scientifically tested for antibacterial activity—we are pretty much alone in the UK in doing this—and tests show that all are high in bioactivity, with the darker honeys having the most. The antibacterial activity is equivalent to the imported and now famous New Zealand antibacterial honey, Manuka. However, all honeys exhibit some antibacterial activity, even if only because of their high sugar content.

Some frames are impossible to spin. These come from our hives where the bees have had fun on the heather. The frames are not just full, they are bulging—almost splitting—with the sheer volume of heather honey. Bees love heather, and we love heather honey since it is so high in antibacterial activity and rich in bioflavonoids. Heather honey is jellylike in texture, or "thixotropic"—neither liquid nor solid, but an in-between state. The best way to extract it is to cut out sections of honey from the complete frame. This is comb honey. But this method does not allow us to return the wax empties to the hive—there are none. So it can be a drain on wax and I sometimes consider it a selfish act on our behalf. However, we only cut out sections when we have had a tremendous harvest of heather.







Choose your honey carefully. It pays to seek out raw, unprocessed honey steeped in nourishing pollen and natural bioflavonoids.

We Are What We Eat

There is only one food sweeter than honey—the sugar in the date. But no form of sugar shares the therapeutic value of the wonderful golden healer crafted by the honeybee. No other insect besides the honeybee provides food for man by converting flower nectar to its concentrated form.

The bee delivers energy to us in a concentrate unobtainable anywhere else in the natural world because it is predigested, ready to act on our metabolism. Even though there are other sugars within honey, all of them are eventually converted to two forms—fructose and glucose—by the bees' secretions of enzymes. Fructose and glucose are the perfect "dynamic duo" to power a bee's flight and foraging because glucose offers immediate energy while fructose builds reserve energy. They can do the same for us, too.

A teaspoon (5 ml) of honey contains 22 calories, whereas the same amount of sugar contains 15, but honey is so much more valuable and refuels the brain within minutes because it contains this "dynamic duo" of two remarkable sugars: honey is almost equal parts glucose and fructose.

All foods that contain carbohydrates and sugars—including sugar—are rendered down inside our bodies to the simple sugar glucose. The body absorbs glucose within seconds—it is an instant energizer—but without fructose the energy is short-lasting. And when the amount of glucose exceeds that needed to fuel the body, it is laid down as fat. Since sugar is added to almost every processed food, we eat much more than in the past (the average American eats $3^1/_2$ pounds (1.5 kg) of sugar a week—15 times more than 100 years ago), which has led to an epidemic in obesity and rising incidence of diabetes.

Fructose confers longevity on the energy provided by glucose. Although similar to glucose, fructose is like a conjurer with a magic trick up its sleeve, because it converts glucose not into fat but into a food reserve in the liver. The magical combination of glucose and fructose in honey directs our energy toward the liver, where it is stored should the brain or body require it.

HONEY VS. SUGAR

Whether refined or unrefined, white or brown, from cane or beet, sugar has no other function in the body than sweetening, triggering an instant energy high and adding calories. Honey is the more valuable natural sweetener because it has other beneficial effects on the body:

- Raw honey is an unprocessed "living" food; it has not been refined, heated or bleached.
- An instant energizer, honey supplies an energy hit to the brain within minutes, but also sustains that energy boost by fueling the liver's store of energy.
- Honey is recuperative—it restores the body's energy at an amazing rate, as seen in research trials with athletes (see page 47).
- Honey has a gentle laxative effect and supports friendly gut bacteria, aiding digestion throughout the day.
- Honey is hygroscopic, meaning it absorbs water—honey will even extract water from a stone or a pebble. In the body it reduces excess water from cells, helping prevent edema, swelling caused by accumulated water in cells and tissues.
- Honey boosts the immune system and has an antibacterial effect both internally and externally, helping the body to heal.





Every tree and plant has its unique color of flower pollen. Gasp at the collected pollen palette in one of our beehives.

The Constituents of Honey

Besides its special sugars of fructose and glucose, honey contains a whole array of vitamins, minerals, amino acids and water plus the all-important plant nutrients known as bioflavonoids, which keep the immune system functioning robustly at times of stress or when faced with bacteria, viruses and parasites.

The naturally bright colors of fruit and vegetables indicate the presence of bioflavonoids, which are responsible for plant pigmentation—carrots, oranges, grapefruits and sweet potatoes just ooze with carotene (yellow color), for example, which makes them top bioflavonoids. These pigments not only provide colour, they have bioactive effects on the body. They are potent antioxidants, protecting cells from attack by free radicals, and seem to make vitamin C work more effectively, for example in boosting immunity. They also keep the heart and circulatory system in good shape, supporting the capillaries in delivering oxygen to cells, tissues and organs, and carrying away carbon dioxide and other waste.

The vast color spectrum of pollen and honeys indicates just how high both are in bioflavonoids. But although honey and bee pollen contain these highly active plant nutrients, the ultimate bioflavonoid in the hive is propolis, obtained from the gums and resins of trees and plants, which produce them to ward off attack and infection (see page 108). To up your intake of propolis, opt for darker-colored honeys (which contain the highest levels of this healer from the hive) or just take propolis itself, as directed on pages 114–16.

WINTER IMMUNITY

The best bioflavonoid to charge up the immune system is vitamin C. Your body cannot store this vitamin and therefore you need to take some in daily to ward off infection. To prevent winter infections, aim to take 1,000 mg of vitamin C every day—this will equip your white blood cells, the "eyes and ears" of your immune system, to stand in the front line in the battle against infection. Oranges and lemons contain both carotene and vitamin C—the perfect combination. On average, a whole orange will provide the total daily requirement of vitamin C for your body, with honey being the perfect vehicle to encourage children to eat fruit for its own sake.



Honey the Nutraceutical

Foods that have proven medicinal benefits, such as honey, are known as "nutraceuticals," "functional" or medical foods. Though they now are the focus of research studies, such foods are age-old healers. My grandmother poured out honey to us all as her "spoonful of sunshine," teaching us to treat it as a golden gift from the bees. She didn't know it, but it was her nutraceutical. There is a seemingly unending book of praise here at Troway Hall attesting to the medicinal benefits of our honey and it is added to daily; people tell us not only of specific ailments cured, but often of a more general lifting of fatigue and lethargy to be replaced by a resurgence of energy and a "get up and go" that was previously absent from their lives.

Millions of honey-loving foodies are often surprised to find that honey heals, but for thousands of years mankind has understood that eating as well—as naturally—as possible was the best way to fight infection. Hippocrates (c. 460–c. 375 BCE), the father of modern medicine and founder of medical ethics, knew the connection between food and good health back in the fourth century BCE. "Let food be your medicine," he said, "and medicine be your food."

Hippocrates believed in honey as the great golden healer—he used it medicinally and prescribed it for his patients, writing that, "honey causes heat, cleans sores and ulcers, softens hard ulcers of the lips and heals carbuncles and running sores." It was used successfully in this way for hundreds of years (see page 40). But after Sir Alexander Fleming (1881–1955) discovered the antibiotic penicillin by chance in 1928, the well-adopted use of honey in surgery and medicine began to take a back seat. Medical science preferred to think that traditional medicine, such as beehive remedies, was no longer appropriate for a modern society. But in recent years, the growth in drug-resistant infections, or "superbugs," such as MRSA (methicillin-resistant *Staphylococcus aureus*), has encouraged a change in perception. Ancient beehive "superdrugs" may be the answer—in many hospitals raw antibacterial honey is used to treat infections that no modern drug can knock back and to encourage new healthy tissue to develop in dramatic style. Honey now comes to the rescue for everything from abscesses and fungal infections to non-healing wounds following surgery.

Honey contains over 180 properties—a balance not available in any other food—to help us keep fighting fit internally. It is truly remarkable when high antibacterial honey is placed on wounds oozing pus or when honey is gently smeared on burns instead of the prescribed ointment silver sulfadiazine. Clinical results have shown the greater effectiveness of honey and in a shorter healing time too. The latter clearly demonstrates the property of regeneration of skin and tissues by honey—far ahead of many pharmaceuticals in use. Honey stops cross infection in its tracks too and stops further contamination moving onto other wounds. There is no doubt that many of the medicinal, antibacterial and healing properties of honey still baffle modern scientists, but honey's true worth and performance against infected surgical wounds and skin infections works when everything else has failed. Research by Dr. Shona Blair at Sydney University in 2007 concluded that honey dressings should be used as a "first choice" and not as a "last resort," but she added that the type of honey was important, as some honeys have up to 100 times more antibacterial properties than others.

Are we not all bombarded by endless television commercials with sylphlike healthy women devouring probiotic yogurts that have changed their lives? The message is one of "friendly bacteria" or probiotics wrapped up in a daily pot of yogurt. In fact, the more "friendly bacteria" in your digestive system, like *Bifidobacteria* and *Lactobacilli*, the greater the resistance your body will have to fight pathogenic (disease-causing) bacteria. It is in with the good guys and out with the bad guys. Perhaps this is why honey has such admired





Raw, unprocessed honey with the telltale ring of pollen on top.

therapeutic qualities—that leave us fit and well feeling. It could be due in part to friendly bacteria. In January 2008, two PhD researchers at the University of Lund, Sweden, Dr. Tobias Olofsson and Dr. Alejandra Vasquez, presented their findings to the 2008 First International Symposium on Honey and Human Health, and showed that different types of honey possess large amounts of friendly bacteria.

There is no doubt that bees are highly selective in the nectar they seek from an abundance of flowers and, if they are given a choice, will automatically sniff out those flowers reputed for high-value nutritional and antibacterial nectar. Bees enforce a choice on themselves for the benefit of the beehive first—and for our benefit as a bonus. That both friendly bacteria *Bifidobacteria* and *Lactobacillus* have been found in honey is not only a bonus for our digestive and immune systems, but is further beneficial in that friendly bacteria can live off honey in our gut, as a prebiotic, at the same time.

Honey's role as a preventative as well as a cure is also now receiving increasing credence and attention in medical and research institutions. As well as treating superbug wound infections, beehive drugs are at the vanguard of natural antibacterial, antifungal and antiviral treatments for cold sores, periodontal disease in the mouth, infected leg ulcers, psoriasis, eczema, conjunctivitis and aching arthritic joints.

Honey Remedies

Choose your remedial honey with care, ensuring that it is raw and untreated—it will reward you. There is no purpose in taking honey once; you will feel little effect. You must make it a daily event—almost a spiritual ritual—all those who handle bees know this to be true. However, honey cannot be the golden wand that puts right overnight years of abuse or neglect of your body by smoking or lack of exercise and an unhealthy diet. Do tackle these lifestyle issues as you take honey medicinally.

Certainly 1–2 teaspoons (5–10 ml) of honey for morning breakfast, on cereal, bread or oatmeal will power up your body for the start of the day. Children can delight in the same—and remember you can eat as much honey as your body craves or demands. Eat honey at any time of day—before bedtime too, as it will settle your metabolism and give you a good night's sleep.

Wound healing

You can use honey externally to treat wounds, skin ulcers, sores, and bacterial and fungal infections. It can help wounds and infections to heal where antibiotics have been overused or where they have reached their limits of effectiveness. In any honey dressing, whether for wounds or burns, it is far better to spread the antibacterial honey to be used on the bandage or gauze dressing itself, before it is applied to the wound. (Make sure the periphery of the wound is cleaned with a saline wash first.) The honey should not be sparingly applied as a thick syrupy honey separation between the wound and dressing will accelerate healing and avoid detrimental contact between wound and bandage. Two or three additional wraps of dressings or bandages will contain any leaking honey and soak up excess honey or wound fluids if required. Do change the dressing every 24 hours, preferably at night, so that movement of limbs is less than normal. This will give the wound a chance to heal in a quiet phase. You will observe that as soon as the malodor (smell and a major sign of infection) of the wound has disappeared, probably after 7–8 days, the wound will

Heather honeycomb (top left) taken straight from the hive. Eaten with the wax it is an excellent laxative and pick-me-up. Honey can also be used to sweeten drinks or yogurt.

show signs of healing and new pink edges of skin will suddenly appear around the area of infection and erosion.

Currently there are more than 20 German hospitals experimenting with antibacterial honeys, and a few hospitals in the UK, Australia, New Zealand and more recently the United States and Canada.

In the pediatric department of the Children's Hospital Medical Center, Bonn, Germany, the ongoing problems with wound healing after chemotherapy treatment for leukemia can become a severe problem. MRSA infection of a wound in one 12-year-old was treated for 12 days with a local antiseptic (octenidin), which saw no improvement. Treatment with Australian antibacterial medical honey resulted in the infected wound clearing after just two days and chemotherapy for the child's underlying illness was started again.

Burns

Honey works wonders when applied externally on burns, removing pain and healing the skin fast. Treat as for wounds (see page 73).

Peptic ulcers

This painful and debilitating condition is caused by *Helicobacter pylori,* which attacks the stomach or intestinal wall. Honey seems to be particularly effective against this bacterium. *H. pylori* is particularly common in the United States. About 20 percent of the U.S. population under 40 and 50 percent over 60 are infected with it. Researchers have found that the bacterial curse *H. pylori* is likely to be transmitted through mouth-to-mouth contact, such as kissing. But 2 teaspoons (10 ml) of honey up to three times a day for several weeks stops this bacterium in its tracks (U.S. National Library of Medicine). My husband suffered dreadfully from stomach and duodenal ulcers for years until I met him. But within 10 weeks he was a new man thanks to my insistence on 4–5 teaspoons (20–25 ml) of raw honey every day. You have nothing to lose—it is the sweetest remedy!

Irritable Bowel Syndrome (IBS)

Honey encourages friendly bacteria in the gut and provides lots of goodness for them to feed on. IBS occurs in many more women than men and there is no doubt that people with IBS suffer from the effects of certain foods far more than the rest of the population. Gastric analysis or endoscopy might reveal absolutely nothing but you could still be later diagnosed with IBS. Take a minimum of 3–4 teaspoons (15–20 ml) of honey a day to subdue symptoms such as bloating, abdominal pain or diarrhea. So many sufferers now reveal how much they depend on antibacterial honey for relief of this condition.

Thrush

Taking antibiotics wipes out not just disease-causing bacteria, but friendly bacteria in the intestinal tract, especially a prolonged course of antibiotics. This leaves you vulnerable, tired and open to infection by the thrush fungus, *Candida albicans.* Painkillers, fluoride added in water supplies, or naturally occurring in black and green teas, together with the contraceptive pill also slay precious gut bacteria. Honey can help rebuild immunity. Take at least 4 teaspoons (20 ml) a day—for at least four to five weeks—remember the gut is over 32 feet (9.75 m) long—quite a distance for the honey to cover!

Constipation

Liquid honey has a mild laxative effect especially appropriate for constipation associated with aging and the digestive bloating caused by a diet rich in processed foods and low in fresh fruit and vegetables. Fresh honey eaten with the beeswax comb can have a positively explosive effect! However, this is in limited supply






Add honey and lemon to warm drinks as is soothes croaking throats and keeps colds at bay.

because it is impossible to produce in quantity (the beeswax is required by the bees to create the next harvest). Consume at least 2–3 teaspoons (10–15 ml) of liquid honey daily—and certainly 2 teaspoons (10 ml) of comb honey.

Water retention

Honey is a diuretic and removes excess water from tissues and joints. This can bring relief if you suffer from inflammation in any part of the body. Always take 2–3 teaspoonfuls (10–15 ml) per day, but if you feel this is inadequate take more—you have nothing to lose but constipation!

Calcium boost

Combining honey with a calcium supplement can increase calcium uptake by 20 percent thanks to the glucose and fructose content. Many osteoporosis sufferers like to enjoy honey for breakfast on toast, with yogurt or even in tea to make a calcium supplement more effective.

Conjunctivitis and cataracts

This remedy was hailed by the ancient Egyptians, especially for cataracts that develop with age. Cataracts account for 70 percent of blindness in Nigeria, where liquid honey administered with a dropper has saved the eyesight of thousands. The process may sting a little, but I drop honey in my eyes twice monthly as a preventative. Just 2–3 drops per eye—or as much as I can tolerate before the honey starts a stinging effect.

Hay fever

Honey can successfully relieve the symptoms of hay fever because it contains pollen grains, but nowhere near the number of grains as found in pollen capsules. For almost instant symptom relief, take pollen capsules. Probably 3–5 capsules a day will do the trick—always increase this number daily if the symptoms persist and continue to cause abject distress. The amount of honey, by contrast, would be wildly out of proportion—say up to three-quarters of a jar per day. Some sufferers however, found that their mild symptoms are soon smothered with 2–3 teaspoons (10–15 ml) of high-pollen honey daily.

Colds

Most colds are caused by viruses, against which antibiotics are ineffective. Honey is a natural antiviral. Take an abundance of good antibacterial honey—as much as your body can enjoy! To ward off children's colds, present honey at mealtimes on yogurt or cereal (cereal manufacturers make millions by advertising the honey in their sugar-laden products—so why not give children the real thing?).

Coughs

In a Pennsylvania State College of Medicine study, a spoonful of honey outperformed over-the-counter cough medicine containing dextromethorphan. Honey was found to be especially effective for children's coughs.

Sore throat

Take spoonfuls of raw honey or stir 2 teaspoons (10 ml) of runny honey into 1 teaspoon (5 ml) of cider vinegar. Dilute with water, gargle and sip slowly through the day. Add warm lemon juice and a drop of essential oil of eucalyptus to soothe congestion. Oil of eucalyptus can be used as a steam inhalation and soothes congestion like nothing else. Remember, there are recommendations on the use of eucalyptus oil. It should not be used in children's medicines or prescribed for pregnant women, but small infusions of eucalyptus do ease colds and catarrh and just like honey, can be applied to wounds and infections to alleviate disease and infection.



Cinnamon sprinkled on honey, commonly used in the United States—great for circulation and creaking joints.

Night cramps

Take 2 teaspoons (10 ml) of honey before bedtime to ease the legs in particular—the arteries are dilated by the honey, therefore alleviating this potentially worrying problem.

Insomnia

Mix 2–3 teaspoonfuls (10–15 ml) honey in warm water or milk 30 minutes before bedtime to be rewarded with a good night's sleep. Reading about Winnie the Pooh while eating finger-licking honey toast is a recipe made in heaven for children's bedtimes.

Bedwetting

If given before bedtime, honey can lead to a noticeable improvement in overnight dryness, especially in young children. But do discourage excess drinking after 6 pm. Offer 2–3 teaspoonfuls (10–15 ml) at bedtime, on cereal, bread or in milk or a warm nighttime beverage.

Bedsores

Honey provides wonderful relief when used in a compress, which feels comforting as well as being curative. Two to three tablespoons (10–15 ml) of antibacterial honey on gauze applied directly to the skin should do the trick. Check and replace daily.

Rheumatism

Enjoy honey for breakfast with a dash of cinnamon and stiff knees and sickly muscles will become less of a problem. Preferably take 2 teaspoonfuls (10 ml) infused with cinnamon in the morning and the same before retiring for bed at night.

Aching joints

Although there is as yet no scientific evidence to back this up, many arthritis sufferers swear that honey relieves inflamed arthritic joints. Take 3–4 teaspoonfuls (15–20 ml) daily. For added effect, take alongside propolis (see page 116).

Blood pressure

Borage honey, or as the Romans called it "happy honey," contains the herb borage, which works in a similar way to the statin drugs prescribed to lower blood pressure. Borage widens the arteries and the engorged blood supplies deliver feelings of well-being and energy—hence "happy honey." Take 2 teaspoonfuls (10 ml) at a time—whenever the mood takes you through the day!

Healthy heart

Honey has minute traces of acetylcholine. This helps to transmit nerve impulses throughout your body. Measure your pulse, then take 2–3 teaspoons (10–15 ml) of honey 30 minutes before bedtime for two to three weeks. Take your pulse again and you should notice the difference. Your pulse rate will be lower and more stable. Your heart rate (pulse) is the engine of your body and the more stable and consistent it is, the less risk of heart disease.

Diabetes

Here honey plays the good guy and the bad guy—mostly depending on the diabetic's approach to "moderation" in its consumption. Honey is a superior food to sugar and has the benefit of the dynamic twin sugars, fructose and glucose, besides minerals, vitamins and antibacterials preprepared by the honeybee. Packet sugar is singly sucrose, and although less sweet than honey does not possess the antioxidants of honey, which can help in weight reduction too. If you have a small teaspoon of honey then cut down on other carbohydrates—balance and moderation are key here.

Boosting immunity

Honey can be used to treat symptoms of low immunity, such as fatigue, repeated infections, allergies, colds, flu and slow-healing wounds. It can also encourage a good night's sleep, which aids the immune system. Take





A perfect way to start the day—fresh crusty bread heaped with honey.

2–3 tablespoons (10–15 ml) of honey every day. A good way of increasing your honey intake is to substitute honey for sugar in tea or coffee. Spoon it in at the last moment once the cup has cooled; the honey shot can then better deliver its antioxidant and antibacterial properties.

Instant energy

Honey can provide energy within seven minutes according to research on athletes. Remember, honey is a living food, being predigested by the bee, which makes it easier and quicker to enter the bloodstream but still provides a slow burn effect that lasts longer to produce great stamina and endurance, when the white sugar surge is over and finished. Our giant mammalian brain simply depletes the body of energy. The free fructose and glucose sugars in honey restore brain activity constantly, thus reducing or eliminating fatigue at times of our greatest physical and mental need.

For an instant energy drink, pour 2 quarts (1 l) of pre-boiled warm water into a large pan. Dissolve 7 ounces (200 g) of unprocessed honey and 1/2 teaspoon (2 ml) salt and finish off with the juice of one or two lemons. Store in the fridge for two to three hours before drinking to chill—the taste is awesome and the energy kick fantastic.

Depression

A teaspoon tipple of honey stirred into warm milk or water is said to pay huge dividends in soothing frayed and frazzled nerves. Calm down stress and worry with a truly sumptuous drink—your own mini world of milk and honey will promote a spiritual calm.

Weight loss

Honey is a good dieter's aid because it is sweeter than sugar, ensuring you use less. Honey has more calories per teaspoon (64) than sugar (46), but honey is much sweeter and lower amounts will normally be consumed. Honey can actually be used to help in a calorie-controlled diet, in that a teaspoon taken at night keeps the brain fueled throughout your sleeping hours and you will awake alert and ready for action and the day ahead.

Infertility

Honey and cinnamon mixtures have been used for infertility in men and women through the centuries. Two teaspoons (10 ml) of honey with an added dash of cinnamon taken before bedtime has been the advice from generation to generation of Hindu medics to couples who cannot conceive. Honey calms down the nervous system—so a relaxed couple might be parents someday.

Baldness

Folklore advocates rubbing honey vigorously into the scalp with a cut onion. The onion encourages blood circulation and supposedly multiplies the regenerative effect of honey. Please phone if it works—it's worth millions!

Lice and nits

A favorite medieval and Victorian remedy; rub honey directly into the scalp nightly to eradicate the hostile parasites. The high concentration of antibacterial properties and sugars work on the offending parasites. Better to rub the honey on the scalp in the afternoon, so that the effect continues through the night too—a longer time to knock these invaders out. A shower cap during sleep will prevent a sticky bed and sheets.

Memory loss

There are so many remedies to prevent memory loss, especially during or approaching old age. A quick and active mind has been attributed to honey eaters the world over especially when pepper or cinnamon are added to a honey drink. Drink a glass of warm milk or water with 1–2 teaspoons (5–10 ml) of good honey and a shake of spice daily.

Bee Stings and Venom Therapy

Hardly a week goes by where I am not asked by someone if I would allow them to get close to the bees and purposely be stung by some of them. So many sufferers of arthritis, gout, shingles, tendonitis, rheumatism and MS almost beg to be inflicted with bee stings and the consequent venom—which hurts, believe me! Some customers relate how they have received such treatment when abroad in the Far East and felt much better for it.

Bee sting therapy involves placing the bee's stinger over certain pressure points and was granted legal status in China in 2007. The therapy goes back 3,000 years or so and was probably the predecessor to acupuncture. Venom from bees is a powerful anti-inflammatory and similar to, though 100 times more powerful, than hydrocortisone. Bee venom is said to stimulate the adrenal glands and relieves pain while improving mobility, coordination and vision in MS patients. The aim of bee sting therapy is to manipulate the bees especially to sting the skin so effecting pain relief and improvement of coordination. The venom seems to reduce pain significantly and the patient feels much better and livelier than before.

In a clinical situation there is an agreement by the patient to be stung by bees kept purposely in the hospital just for this job. Bees numbering from five or six up to 60 or 70 are placed on the allocated position and allowed to sting the patient. Their skin becomes red and inflamed and of course the bees die as they do in the wild as the sting drags out the venom sac and part of the entrails within the bee. But the clamor and praise rings out through many continents about the effectiveness of this treatment. It has to be taken seriously, as many medical professionals have resorted to bee venom therapy as the last hope from sheer despair. Due to sometimes lethal allergies to bee stings, please consult a professional before undergoing therapy.

A STING IN THE TAIL

About three years ago, a very pretty girl (I found out later she was over 40) and her husband came dashing through the shop doorway. It was a Saturday afternoon in summer and the shop was full to bursting. She waved her hand behind a crowd of folk and shouted something. About what I had not a clue. There was too much noise and chatter. She disappeared. After about 20 minutes she returned to an almost empty shop and exclaimed "You see—they just won't sting me!"
I gazed in amazement—what WAS she on about? She had been down the meadow slopes to the first line of beehives and thrust her arms and hands into the entrances of the beehives. She had become so fed up with their lack of response that she gave up after visiting seven or eight hives. "Why have you done that?!" I shrieked—worried stiff there would be a swarm of following bees hurling around the corner and worried sick that she could have been dead.

"No chance—I've been to a few beekeepers and I know the score. They haven't as many bees as you!" She then started to tell me that she had MS and was painfully losing coordination of her body. She had been told by so many sufferers of MS that bee stings would help—so here she was.

There was just one big problem: even with thousands of bees in the air and whirling around endless hives, they just would not sting her. I watched her approach a hive nearby. If anything the bees avoided her arms and her intrusion. It was as if they could smell or detect some pheromone or substance, which they avoided and deviated away from. If ever there was a research project in the making, this has to be it.

HONEY AND BABIES

Nearly every jar of honey carries a warning for parents: unsuitable for children under 12 months. Infant botulism caused by the germ *Clostridium botulinum* causes severe symptoms in babies—called the Floppy Infant Syndrome. Symptoms include floppy arms and neck, weak and ineffective sucking and feeding with obvious signs of breathing difficulties. The bacteria are mostly found in soil or badly canned foods, and form the most hardy and uncompromising spores. It was surprising then to find cases of these spores and their toxins in honey in America in 1976. Bees might just bring in microparticles of soil on their legs, which could contain *C. botulinum* spores. In fully concentrated honey, in which the concentration of sugars is high, the spores remain dormant. But when honey is diluted—as in an infant's digestive system—the spores can grow and secrete the dangerous toxin.



Food for Thought

My greatest concern as a beekeeper is the use of chemical sprays by farmers on their crops, which drift to the margins of fields where bees love to forage on wildflowers, weeds and hedgerow plants. There are few safe havens for bees from the sprayer pipes of tractors, and there can be little doubt that the new neonicotinoid class of insecticide has contributed in part or whole to the collapse of beehives and the death of bees worldwide. Modeled on the natural insecticide nicotine, this type of insecticide acts on the central nervous system of insects, causing paralysis and then death. The substance can stay in the growing crops for 90 days or more.

But the issue of sprays extends further than the death of the bees. Some three billion tons of pesticides are applied globally each year. Cultivation of five crops—wheat, corn, rice, cotton and soy—now accounts for 50 percent of the pesticides used worldwide. These agrichemicals can be detected at both the North and South Poles and in the deepest reaches of the oceans. The commercially grown food we eat contains detectable levels too.

Pesticides are the tip of the iceberg—I probably mean lettuce here—for such year-round modern staples can only gain their weeks of "freshness" on the supermarket shelf from preservative treatments and a wash of chlorinated water. Fruit and vegetables should sit at the top of your shopping list for bioflavonoids and vitamins, but in eating them you could also unintentionally be imbibing five man-made chemicals a day, too. In one study (from the Consumers Union of the United States), pesticide residues detected in peaches from the United States were 10 times greater than in peaches grown in Chile. The reason for this disparity is that U.S. peach orchards are sprayed between seven and 10 times with pesticides throughout the growing period. Unfortunately, the consumer is not warned, despite recent studies (in April 2009 by scientists at the University of California, Los Angeles) implicating pesticides as possible

The blossom in our orchards kick-starts the bees' honey-making in spring by providing nectar and essential food for baby bees—pollen.

contributory factors in Parkinson's disease and aggression in children.

Until 2006, farmers in the European Union were allowed to add antibiotics to the food of pigs, cattle and chickens. It led to quicker growth and more meat on the animals—and greater dividends for shareholders—but was a disaster in waiting for the consumers ratcheting up antibacterial resistance with every steak or glass of milk. This practice was banned in 2006 because of the fear of antibiotic-resistant superbugs. But visit any farm and the potions are there for all to see, and antibiotics injected to treat lameness, coughing or pneumonia, or assist lambing or calving will trickle down the food chain to us. The United States still allows farmers to add antibiotics to animal feed: the Union of Concerned Scientists estimates that as much as 70 percent of the antibiotics used in the U.S. are given to healthy animals. Farmed fish have their share of antibiotics and additives too—farmed salmon may be raised in polluted waters on food sauced with artificial colorings, unlike their wild cousins whose paler pink flesh is colored only by the shrimp they feed on.

Professor Vyvyan Howard, a toxicological pathologist at the University of Ulster, sits on the British government's Advisory Committee on Pesticides. He believes that the cocktail of pesticides in our fruits, vegetables, grasses and crops moves down the food chain first to the animals that consume them and then to ourselves as secondary consumers of animal products. He states that the average Briton's body contains 300–500 man-made chemicals that were not present in the environment 50 years ago. It's bad enough for adults, but especially harmful for unborn children, because some of these contaminants can cross the placenta. They may be capable of hormone disruption and other metabolic changes, even in minute amounts.

How does this affect we beekeepers and you the consumer of honey, pollen and everything else from the beehive? We can try to site our hives in places far from chemicals. Bees are conservationists—they don't waste a whisper of energy—and have an intelligent navigation system, always visiting the flowers nearest them, providing they are rich in nectar and the pollen has a high protein content. So if beehives are strategically placed in beautiful floral areas uncontaminated with pesticides or herbicides, they always choose the easy route. Or so we thought until 2009.

After sowing bee-friendly crops like borage and phacelia alongside acres of peripheral wildflowers, we patted ourselves on the back and expected a bumper honey season. Late spring and summer fused, with wind and rain soaking the fields day after day. The honeybees in the newly sited beehives were struggling to feed themselves, never mind making extra honey for us. Summer came and went with the honey frames only half full; what's more, the bees became indecisive and muddled. We worried our hearts out. A few hundred hives have a lot of occupants and they were not performing—or were we not performing?

We left the bees undisturbed until the first week in September, when we reluctantly had to lift the lids of the hives. We were pessimistic as we did so, but shock of shocks, the frames were bulging—oozing with the most sensational heather honey. Every hive was bursting. The bees had found what they wanted, not what we offered them, by traveling farther afield. We gathered tons of the highest quality honeycomb heather honey.

Beekeepers have a great responsibility to ensure that the forage—the flowers from which their bees take nectar—are not drenched in pesticides, but we can't account for bees' behavior. And we have to be realistic—



Bees lining up at the hive entrance to unload pollen and nectar.

many beekeepers gain an income from transporting their hives to fields of canola, borage or field beans so that they can enjoy a terrific honey harvest. Fortunately, farmers and beekeepers enjoy a symbiotic relationship on the whole, and most pesticides are only sprayed after pollination, once the bees have finished their work. After all, why would a farmer pay a beekeeper to put hives among his fields to ensure high yields if his pesticides would kill the bees before this occurred? The same is true of orchard owners. The first trees in a mixed orchard to blossom are plum and cherry, followed by pear and apples, and during the blossom season, bees form dense clouds around the orchards. No orchard grower would attempt spraying pesticides at this stage. Here at Troway Hall, pesticides are never used and the orchards are sprayed with soapy water in June and July if attacked by aphids.

How can we protect ourselves as consumers from the invisible drugs, pesticides, preservatives and additives lacing our food? It is up to us to seek out pesticide- and antibiotic-free foods and we can only do this by tracing food to its source. Do not be at the mercy of the food processing industry: source your food with care, favoring unrefined and organic ingredients that consolidate the body's natural defenses while contributing to the health of the environment. If you live near the countryside you'll be able to feast your eyes on them outside your window. Our landscape is Mother Nature's supermarket, and local fruits, seeds, vegetables, herbs and tree crops can help us to challenge our addiction to overprocessed foods. That includes honey and other hive foods, such as pollen and propolis, which are loaded with protective bioflavonoids and other health-giving properties. We have the choice to change our lives and preserve our countryside while transforming our energy levels and fighting infection.

Honey and Immunity

Nature's greatest cleanser and healer, honey is an antibacterial pot of gold. It has saved great kings when the prognosis was at its grimmest and now is revolutionizing the hospital treatment of antibiotic-resistant wounds. The bee's level of hygiene is astounding: despite their high-density population, beehives are the most sterile places on the planet because they are drenched in antibacterial honey, pollen, propolis, royal jelly and beeswax. We can use these products of the hive to our advantage, to boost immunity and make our own lives and homes more healthy.

Even in the depths of winter, bees make the effort to leave the hive and empty themselves of excrement away from their living area. It's as if they know that excrement results in disease, especially in the confined space of a hive. They remove their dead sisters similarly so that they can cause no contamination. Bacterial infection is not on the menu in the hive—the place is squeaky clean. Bacteria are kept outside the front door by a sterile doormat of propolis that every leg of each bee has to walk over before entering.

Economy is the key word of the beehive. When bees return from flowers full of nectar and pollen they "hand over" their harvest to a bee waiting at the entrance of the hive. Not only is this good for the worker out in the field because she can return speedily back to the flowers, it decreases the chance of infection sneaking into the hive during a time of great activity and bustle. If fewer bees enter the hive, the chance of disease entering the hive also decreases dramatically. What a lesson in time and motion as well as hygiene!

Inside, the beehive is bursting at the seams with the activity of thousands of bees—each hive contains more



than 60,000 bees. Sometimes the hives are so overcrowded that bees literally spill out. Back-to-back housing must have been the invention of the beehive because the honeycombs are double-sided, meaning that twice the number of baby bees can be raised and twice the weight of honey stored. The teeming bees are all constantly touching each other as they exchange nectar and pollen and fondly encircle the queen bee—they seem almost tender in their need for contact. The queen—and she alone—exudes "happy hormones" for her inner circle of courtiers, who in turn touch other worker bees so that the maternal message is spread around the hive for all to enjoy. All this touching and scrambling around thousands of other bees takes place without any spreading of contamination or disease. Quite the reverse, since each worker inadvertently sterilizes the structure of the beehive and her sisters as she distributes the antibacterial honey, pollen, propolis and beeswax. The secrets of the beehive are not easily surrendered by these inscrutable insects and even after years of study and interaction (and humor), we never cease to be stunned by the bees' premise of high hygiene and cleanliness, which in no small way has contributed to their survival over the last 100 million years.

NOT TO BE SNIFFED AT

Sniffer bees are now used at airports to detect incoming infectious diseases such as tuberculosis. They are better than sniffer dogs because they only take 20 minutes to train and the passengers are unaware that their bodily smells and pheromones are being monitored for disease. It doesn't stop at contagious diseases either, since sniffer bees can detect explosives on planes and Semtex in luggage.

Compare this to we humans, whose earliest ancestors emerged just six million years ago. As we travel through our daily rituals at home and work, touching door handles, taps, light switches, money and keyboards, we do not sterilize our surroundings, but instead pass on potentially harmful bacteria. Our hands are the primary carriers of bugs from *Salmonella* to *E. coli* and *Norovirus*. Hands touch everyone and everything, making our desks nothing more than cafeterias for germs. The average keyboard, for example, has a peak fecal bacteria count of more than 24,000 per square inch. If not cleaned away, these germs will encourage millions more bacteria to flourish, which could eventually cause gastrointestinal upsets, diarrhea and sickness. The World Health Organization states that between 20 and 50 percent of the world's population suffer from diarrhea. Distressingly, diarrhea is the second leading cause of childhood deaths in the world. One person in five will suffer from diarrhea this year and many more will get colds, flu and other viruses, which are all transmitted through everyday dirt and grime.

In theory, washing hands well could prevent the spread of everything from colds to MRSA. There is no need to become obsessive about cleanliness, but you can cut cross infection by washing your hands—make this number one on your hygiene agenda. Don't be the one in three who on average does not wash his or her hands after leaving public lavatories. You should also always wash your hands before handling or eating food and after stroking animals. If you have cuts or scratches, cover them with a bandage to be on the safe side.

Antibacterial soaps have become increasingly popular in recent years. However, research proves that these soaps are no more effective at killing germs than ordinary soap. In fact, quite the contrary; using antibacterial soaps may lead to the development of bacteria that are resistant to the antibacterial chemicals in the soap, making it even harder to kill these germs in the future. Ordinary soap will clean your hands just fine. It is the

friction and combination of scrubbing with soap and rinsing with water that loosens and removes bacteria. Don't mess about floating your hands under the tap with just a trickle of water—scrub those hands to scrub away bacteria.

If you are the manager of a restaurant, hospital, medical center, sports facility or a public company or shop with toilet facilities, do you check the cleaning schedules? Worker bees are superior cleaners. When newly born baby bees emerge from their wax cradles the workers move in right away, cleaning out old wax, pollen and the case the bee has just shed. It is finally given a quick wipe with super antibacterial propolis to finish the job. It is hard to beat that for hygiene.

The Big Honey Heal

The contamination of our bodies by bacteria may feel threatening, but the body is ready to fight back. The white blood cells and antitoxins of the immune system act as its castle walls and buttresses—and there is no better support for them than an excellent diet. Throughout history honey has been used to supplement the diet and encourage our immune systems because it is antibacterial and antifungal, raising the bar against common infections. Source honey in its natural, untreated state and eat 2–3 teaspoonfuls (10–15 ml) every day for life. No longer will every passing cold seek you out; instead you will experience a greater sense of well-being, enjoy better digestion, spend fewer days off work and feel more energized.

This is a long tradition. Alexander the Great (356–323 BCE) left orders that his body was to be preserved in honey upon his death. Signatories of high office in ancient Egypt were also buried in honey combined with other bee products such as beeswax and propolis—honey and preservation have always gone hand in hand. The tradition continues today in the Middle East, where butter



HEALTHY HANDS

To wash your hands properly with soap and water, wet your hands under warm running water and apply liquid soap or a clean piece of soap. Lather well. Rub your hands vigorously together for at least 15–20 seconds. Scrub all surfaces well, including the backs of your hands, your wrists, between your fingers and under your nails. Rinse well. Dry your hands with a clean or disposable towel. Use a towel to turn off the tap. If you have a choice, do not use warm air driers, which can increase bacteria on your hands while spreading contamination around the washroom.

Going trekking or camping? Why not preserve your butter and cheese in a plastic jar of honey? They will keep fresh for several months.

and cheese are still smothered in honey to preserve them during long camel journeys over scorching deserts. There are no fridges in the Sahara.

In 1403, King Henry IV (1367–1413) led one of the bloodiest battles ever fought on English soil, the Battle of Shrewsbury. During the battle his 16-year-old son Prince Hal was seriously wounded when an arrow plunged just beneath his eye and through his nose, lodging 6 inches (15 cm) into his skull. The prince insisted that he see the battle through, until his father's army emerged victorious. Taken to Kenilworth Castle, the young prince's plight became cause for serious concern. Although the arrow shaft had been cut off, the iron arrowhead was still lodged deep in his face. Several doctors came to the castle to give advice but could not decide what was best: poultices, potions or branding irons. The prince was in a perilous condition. Only the best surgeon would do and he was sent for from London.

John Bradmore (d. 1412) was a surgeon of great experience and repute in Harley Street and beyond. He started to probe the deep wound with dried pith of the elder tree (spongy and absorbent), wrapped in pure linen and thoroughly soaked in rose honey. He used bigger and bigger probes to reach the bottom of the arrowhead, coating the entire tissue in soothing honey. Bradmore's secret—the application of honey—soothed, lubricated and healed this potentially fatal injury in the inner depths of the prince's skull. Innovative in its day, a sterilizing wash of white wine and a final healing ointment of honey mixed with barley flour and turpentine were applied. The arrowhead was eventually withdrawn by Bradmore's own piece of surgical kit—a "screw extractor" that penetrated deep into the boy's face and skull. Bradmore made sure that his esteemed patient was given the best healing practices within his vast knowledge, which would have been at the cutting edge of surgery and antiseptics. Prince Hal made a full recovery and succeeded his father to become Henry V.

Honey dressings have been lifesavers on the battlefield ever since. Soldiers cannot cart around fragile jars of honey in their first-aid kit, so from the Napoleonic Wars to World War II, they were issued with a "heal all"—a tiny cardboard box or tin of healing ointment. This was made of honey mixed with lard or cod-liver oil as a fixative. Applied to dressings, it saved soldier's wounds and burns from putrefaction in the middle of the battlefield. Honey provided an instant disinfectant, then healed and provided pain relief, saving many limbs and therefore lives.

EARLY ANTIBIOTICS

The barley in the healing ointment of 1403 probably would have been damp and contaminated (luckily) with the mold *Penicillium* during storage, thus releasing penicillin into the wound. Bradmore's insight came some 500 years before the discovery of pure penicillin by Sir Alexander Fleming in 1928. The turpentine in the ointment, made from the gums and resins of trees which are highly antibacterial, is immensely effective against harmful bacteria. But honey was the crowning glory of the treatment. This wonder of nature slays most pathogenic bacteria and regenerates disintegrating cells within a wound. Nothing in nature can compare with honey for dressing wounds and burns.

PRESERVING WITH HONEY

You can do an experiment to demonstrate the preservative powers of honey. Take three new jars of jam, lemon curd and honey and remove the lids. Leave them open for two or three weeks, without refrigeration. The jam and lemon curd will develop green fungi and white mildew on top and the decomposition of these so-called "preserves" will cause a sour rancidity. The honey will be just as it was, with no signs of contamination. It can be eaten without fear. Any specks that you see on top of the honey are pollen grains, a good sign that the honey has not been processed.




folded
apply
DO

The modern battle is against antibiotic-resistant bacteria. Antibiotics are man-made drugs that prevent harmful germs and fungal infections from harming the body or causing death. When Sir Alexander Fleming discovered the antibiotic penicillin in 1928, he soon became aware that not all bacteria were killed by it. He pondered long and hard, uneasy with the knowledge that some bacteria had become resistant to penicillin and would hand down this resistance through generations of bacteria. Today, we have overused antibiotics ourselves and in farm animals to such a degree that there has been a volcanic eruption of antibiotic-resistant strains of bacteria—or superbugs—with the greatest threat coming from methicillin-resistant *Staphylococcus aureus*, or MRSA. The Infectious Diseases Society of America has declared antibiotic resistance "a public health crisis."

PIGS AND MRSA

A 2007 survey reported in *Veterinary Microbiology* showed that almost 40 percent of Dutch pigs have a new strain of MRSA (strain ST398) and that it has entered the food chain in meat products. Less than 1% of US pork imports come from the Netherlands, but 60 percent of pork in the UK is Dutch. Although only a few cases of this MRSA strain have so far been transmitted to humans in the UK, in the Netherlands it already accounts for 30 percent of invasive infections.

Medically there isn't an answer to these infections. We have no choice but to go back to nature. Bacteria have never become resistant to honey or antibacterial beehive drugs—this is the important difference between bee drugs and antibiotics. Bees have been miles ahead in their challenge to bacterial disease. Over millions of years antibacterial sterility throughout the hive has been patiently sustained—and probably evolved to cope with new onslaughts of resistant microbes and control infection. Now we can use its sterile products to fight life-threatening disease as well as to boost and sustain our remarkable immune systems.

The Honey Research Unit at the University of Waikato in New Zealand has been the prime site for investigating the healing powers of antibacterial honey on wounds infected with MRSA—with terrific success. Its Co-director, Professor Peter Molan MBE, has compared the effectiveness of different honeys against a whole range of bacteria in the laboratory with dazzling results. He has also reviewed clinical trials all over the world which show that wounds notoriously difficult to keep clear of infection or which have not healed with conventional treatment become sterile and start to heal after being dressed with honey, resulting in rapid development of new healthy tissue and discharge from the hospital sometimes weeks earlier than expected. In many cases honey treatment has removed the need for surgery or plastic surgery, provided more effective pain relief and lowered the incidence of scarring.

This is not news to beekeepers—our grandmothers knew the healing secrets of honey. As a child I remember well that the cuts and grazes of rambunctious play posed no problems—a smear of honey on our grazed skin and we were all off to play again. In her later years my grandmother soon remedied a nasty leg ulcer by applying honey on a small piece of gauze to the ulcer and the surrounding area. She changed the dressing every two days and the whole area first became less fiery in color and texture and then the small cavity within the ulcer began to knit together cleanly. Wound and skin dressings using honey rely not just on the intrinsic germ-killing properties of honey but also on its moist and sticky nature. The biggest trouble with handling honey is its stickiness if left on an open wound or cut. You leave a trail of honey wherever you wander. But this stickiness is also its strength because honey dressings never tear skin or cause pain on removal.

Antibacterial honey often heals skin, particularly burns, where other treatments have failed miserably.

The curse of medical dressings is their dryness, which on removal often cause tearing and ripping of the scab as it becomes entangled in the dry gauze. Honey is a soothing lubricant as well as a superb healer. Wounds and honey are a marriage made in heaven.

MEDICAL PRAISE

At the end of a lecture I gave to the Sheffield University Group in 2007, an elderly gentleman rose to his feet and announced himself. Although now retired, he had been a consultant in the Gynecology Department at the local teaching hospital. He explained how difficult, time-consuming and painful it can be to heal cervical tissue after treatment for cancer, since it often remains raw and angry after surgery. He concluded that no medical product that he was aware of could be compared with the soothing, healing and regenerative performance of honey, when applied to the tissue daily. Pain and inflammation were reduced and excrutiating pain alleviated very quickly, he said. Regeneration of cells and tissue could then take effect. He concluded by congratulating the bees and stating that many honeys would be effective for this purpose, but that raw untreated honey straight from the beehive was best. Spontaneously two women applauded his advice. The malodor of cervical wounds had been oppressive and embarrassing for them both, and within a few days of applying honey they had returned to their confident, clean selves.

Why Honey Works

Why is honey such an effective germ-killer? It's smart; it doesn't resort to the "smash and grab" killer punch of antibiotics, killing helpful bacteria alongside the bad. Honey is sweet—and this is one of its healing secrets. It is saturated with simple sugars that suck out water from bacteria and molds. Water is the most important constituent of all living things, so draw out the water and all life—including germs—will be destroyed. Honey can stop bacteria dividing in their tracks, dehydrating the living cells by drawing much-needed water out from under their feet. They are literally held in limbo, disabled and dormant. Dehydrated germs are dead germs. But this is only the start of honey's sweet success.

Honey is also very acidic by nature—it can be as acidic as some vinegars—and germs don't like acid. You might think the acid might be an irritant to humans, too, yet because of its thick and syrupy consistency, honey often brings a great deal of relief to those with gastric reflux. Honey simply sticks to the lining of the stomach, for example, preventing further damage to the inside of the stomach by its natural hydrochloric acid. Honey's adhesive and healing qualities give peptic ulcers a chance to heal while the honey stops *Helicobacter pylori*, the culprit causing peptic ulcers, dead in its tracks after several weeks of consumption.

Bear in mind that it is the bees' job to perform two tasks after sucking precious nectar from flowers. The first is to transform sugar into that dynamic duo, fructose and glucose, which are "immediate" sugars and charge our energy levels within seven minutes. Second, to make Mother Nature's prime sterilizer, hydrogen peroxide, by mixing the honey with an enzyme, glucose oxidase, which converts glucose to gluconic acid and hydrogen peroxide.



That's why honey is acid and highly hostile to the bacteria with which it comes into contact. Sounds complicated, when in fact, it is quite an everyday event for bees. When honey touches water, as in leaking wounds and cuts, or is just diluted with water, then its hydrogen peroxide factory starts and the process of quiet and continuous sterilization begins. Good raw honey is charged with a natural sterilizer bullet invisible to you and me the beekeeper: hydrogen peroxide.

This hidden hydrogen peroxide kills germs stone dead. Just because hydrogen peroxide is water with added oxygen, there is a tendency to underestimate its power. Free and active oxygen is a death sentence to harmful bacteria and fungi. Hydrogen peroxide is better known as the bleach used to lighten hair or whiten teeth and sterilize kitchen surfaces and toilets. In fact, it is so good at releasing free and potent oxygen, that hydrogen peroxide is actually used to disinfect the very inside of ambulances in one big spray mission. Ambulances are traveling bacterial bombs on wheels. Hydrogen peroxide is the Angel of Mercy for peace of mind for patients— they just need to know that it is being used regularly to maintain a sterile environment within their ambulance, at the one time of their lives when hygiene matters most. Hydrogen peroxide is more eco-friendly than chlorine-based disinfectants, which we use in our swimming pools and put in our drinking water to obliterate any chance of bacterial cross infection. The long-term residual effects of chlorine are terrifying in that its dioxin by-products can be seriously toxic with a risk rate of 300,000 times more potent a carcinogen than DDT in the 1960s. Dioxins do not break down easily in our environment and accumulate in waste and river water where eventually all animal life will reap their legacy of dioxin dump. Dioxin's attendant immune and cancer threatening liability goes even further as it becomes concentrated in living cells, contributing to multiple birth defects and reproductive failure. The great alternative, hydrogen peroxide, is all around us in Mother Nature and is the healthy highway ahead.

Honey produces a generous supply of this gentle hydrogen peroxide for us to use both inside and outside our bodies without a prescription and with no risk of complications because it complements the way our bodies work naturally. When our cells are damaged or infected, the body automatically retaliates by flooding the area with naturally produced germ-killing hydrogen peroxide—it acts as the body's first line of defense. The vagina, for example, continually releases hydrogen peroxide to swipe away thrush or other fungal, bacterial and viral infections, which can cause vaginitis or bladder infections. And before breast milk becomes plentiful, newborn babies suck on colostrum, which contains hydrogen peroxide, jump-starting the baby's immune system.

The British Army gained some fame at the end of World War I by giving soldiers devastated by Spanish Flu shots of hydrogen peroxide with great success. It treated them similarly for tuberculosis, venereal disease and typhoid fever. But you should never take hydrogen peroxide in the form sold by pharmacists—a 3 percent concentration. It is dangerous and contains other harmful chemicals. Applying honey straight from the jar will not swamp you with hydrogen peroxide because this springs to life only when needed—as it comes in contact with the water-swollen infected cells in a wound or open infection.

Honey Technology

The food industry has adopted hydrogen peroxide for its preservative and antimicrobial properties. Vaporized hydrogen peroxide is one of the newest sterilizers used in the packaging of fruit, vegetables and cheese. It keeps food free from decay and extends its shelf life by days, if not weeks.



Honey can greatly aid the survival of a damaged or infected tree.

Gardeners and farmers are making use of hydrogen peroxide too. Rainwater is much healthier for plants than tap water. This is because when rainwater or snow meets the billions of oxygen atoms in the ozone layer it quickly disintegrates to form hydrogen peroxide. Bulbs burst into action after a snowfall because hydrogen peroxide gives a boost of oxygen to plant roots while sterilizing any plant pathogens, which can nibble away the plant body. It is also purposely sprayed onto crops to increase yields.

Honey is also miraculous when smeared onto damaged branches or infected plant systems. It provides the damaged plant with a constant supply of hydrogen peroxide, the antibacterial shot needed to breathe new life into the plant. We use it at Troway Hall on our orchard trees when branches snap off or fungal infections threaten the very survival of trees.





Dandelion pollen packed in baskets on the bee's back legs.

HONEY DRESSING

Keep a jar of antibacterial raw honey in your medicine cabinet for wounds that refuse to heal and for when antibiotics have had no or limited effect. Generously smear the honey on a piece of gauze and wrap it around the wound. Change the dressing the next day—preferably at night. Use this for any of the following: abscesses, bedsores, cervical ulcers, chilblains, cracked nipples, cuts, fungal infections, leg ulcers, pressure sores, wounds (including surgical wounds), burns, skin ulcers and infections. This will also fight infection in horses, dogs, chickens, cows, pigs and cats.

Self-Help with Honey

So how can we help ourselves to combat infection? Certainly by cleaning ourselves and our surroundings thoroughly—and by using antibiotics more wisely, asking for and depending on them less so that they are reserved only for times of greatest medical need. We should be more aware of our immune systems, too, which move into action much more readily when charged by natural, unprocessed foods. The beehive offers us a world of antibacterials, antivirals and antifungals ready to strengthen the immune system, providing it with the ammunition it needs to defend the body's organs and the cells within those organs. Start now by taking 2 or 3 teaspoonfuls (10–15 ml) of raw honey every day. Note—you might be offered "baker's honey" which is third-grade honey, probably blended and heated, but suitable for cooking. This will flavor ham or cakes, but will have very little, if any, antibacterial quality as found in fresh honey. Whether you choose honey from abroad or from your doorstep, make sure your jars of gold are unprocessed and unadulterated. Remember that honey that looks tainted by "scum" has nature's best ingredients trapped within it.

Many of my customers know this already. People from every walk of life come in search of our antibacterial honey, from hospital consultants, marine commanders and nurses to painters, carpenters and carpet fitters. Some have the most inflamed or infected wounds, others suffer excruciating pain with every movement and many have taken a variety of conventional medical prescriptions and suffered for months—sometimes years—with no relief. With public health services unable to help them, these people turn to honey, even if at first they have no confidence in it. Our antibacterial honey has never failed them. Moreover it's a thrifty alternative to expensive over-the-counter medication, and completely free from any unanticipated side effects.

Plant Remedies

Plants are as essential an ingredient in medicines now as they were in the past—in fact the word "drug" comes from the old French *drogue* or old Dutch *droog* and simply means dried goods or dried plant, because in the past medicines were dried herbs. In recent decades, chemical manufacture has taken over from simple extraction from plants in order to supply global demand for medicine.

Currently, more than 50 percent of drugs in clinical use originate from the natural world, with about half of the world's 25 best-selling pharmaceutical medicines derived from natural products. Of the drugs introduced in the United States over the past 25 years, 70 percent have been derived from Mother Nature. For example, the aspirin we take for day-to-day pain relief comes from the common willow, digitalis used for heart stimulation is extracted from the common foxglove, morphine taken





Honey comes in a wonderful spectrum of colors, all providing an all-round rescue remedy.

for the relief of severe pain famously comes from the opium poppy, and taxol, one of the most potent anti-cancer drugs, is derived from the Pacific Yew tree.

It is therefore not surprising that honey, pollen and propolis from the beehive should be effective in combating disease—they are all derived from flowering plants via the bee. Thousands of plants have to defend themselves each day from being attacked or eaten by grazing herds. If they had no form of defense they would become extinct. This accounts for their powers to sedate, suppress, heal and also to destroy. After picking up pollen and nectar from flowers, bees fly back to the beehive with their plant cargo, where they charge it with the antibacterials, antifungals and antivirals that bees use to protect themselves and ensure their survival in the beehive over the cold, wet winter months. Honey is just the beginning of smart beehive drugs, as we will see in the next chapter.

Super Honey

Some honeys go the extra mile and are exceptionally high in their antibacterial action. The extra health-giving properties are a result of the superior plant substances in the flowers and trees that the bees visit. As a general rule, the darker the honey, the richer it is in antibacterial and antifungal activity. The mineral, vitamin and bioflavonoid content in these darker honeys will also be higher.

Manuka and Jelly Bush honey (New Zealand and Australia) The best-known super honeys. Both are from the family of tea tree plants (though slightly different) but in Australia the plant is called Jelly Bush, while in New Zealand, its sister is called Manuka. Both plants produce tea tree oils, which differ markedly in their chemistry and applications. The rivalry seems to be fierce between the companies who market these separate honeys, so the consumer must choose for themselves.

Dark honeys (Worldwide) Whether from sweet chestnut, lavender or heather, darker honeys have a greater ability to bust microbes than lighter honeys, such as acacia and canola. Sage, thyme, rosemary and buckwheat honeys are reliable bacteria busters whether used internally or externally. Strong malty buckwheat honey is good to boost the immune system. Having a malty and caramel taste, it is high in antioxidants. Buckwheat and chestnut honey hit the taste buds with a wow when eaten with strong cheeses such as Gorgonzola, Stilton and Camembert. Thyme is a natural medicinal and its healing properties are heralded through the centuries and thyme honey was the favorite in European Monastery Gardens. Thyme honey has a bonus of antibacterial properties—if you can cope with its strong and searching taste.

Troway honey (UK) The bioactive antibacterial honey from our own bees at Troway Hall is unique in the United Kingdom. It has been tested and acclaimed as a highly antibacterial honey thanks to the added gums and resins collected by bees from the thousands of fir and spruce trees we have planted for Christmas (page 103). Its antibacterial punch is more powerful than other honeys and its effectiveness on broken wounds and ulcers is remarkable, but it really excels in its ability to boost everyday well-being against colds, coughs and digestive rumblings. Bioactive honey from Troway Hall has a full and caramel taste—excellent on ice cream and fruit, great with cheese and wonderful enjoyed on fresh crusty bread and butter.



Honey and resins

Many years ago I noticed that some types of honey here at Troway Hall were becoming darker and changing in taste—for the better. They were more caramelized and aromatic, and the honey soothed sore throats quicker than our original honey. I was not sure what had changed, so we embarked on laboratory trials. The thousands of fir and spruce trees that we grow for Christmas here in Derbyshire yield rivers of gums and resins that smell divinely clean and aromatic—just like frankincense and myrrh. Such resins are antibacterial, helping the tree to defend itself and providing protection from predators, disease and infection.

From the end of summer, when the bees are in full flight but flowers are becoming more scarce and honey production is on the wane, the Christmas trees start to ooze. Gums and resins run down the bark or around the beautiful cones in huge volume. The bees switch their attention from the flowers to tree resins—they actually paint the inside of the hive with this super-antibacterial sticky stuff, which protects the hive from disease. Eventually the diluted resins infuse into the beeswax combs and, more important for us, into the honey.

Bees have been on the trail of lonesome pine resins for over 100 million years, and mankind has also used these tree gums for keeping disease at bay. It was no coincidence that of the three gifts of gold, frankincense and myrrh given to the infant Jesus, two were tree resins, like our own. Frankincense and myrrh ooze as pale yellow gums from the bark of trees in Africa, the Red Sea countries and Saudia Arabia. Well known through the ages as an anti-infection agent when burnt or chewed, frankincense is still wafted during religious ceremonies worldwide, and in Saudia Arabia is added to coffee to prevent tooth decay and sweeten the breath. New mothers would actually squat over burning frankincense to overcome infection, and child-bearing women are still tutored in its fast-healing properties. Myrrh has been used as a disinfectant or for fumigating houses, tents and the human body.





International cosmetic companies depend heavily on honey for its mammoth moisturizing effects. Use it with milk like Cleopatra!

Natural Beauty Remedies

Just the mention of Cleopatra, legendary queen of Egypt, fuels the air with evocative thoughts of beauty, charisma and sexual allure. Her vivacity, physical splendor and radiant skin, it is said, owed a great deal to the secrets of her cosmetics, baths and anointing oils. All this when she had to tolerate scorching temperatures and protect her face from the battering effect of abrasive windblown sand. How did Cleopatra do it? Her prime beauty secrets were milk and honey—she literally bathed in them, and so can you!

Cleopatra's Milk and Honey Bath

This is a bath for beautifying your skin, not for cleaning and scrubbing it. Wash yourself and your hair first in a regular bath or shower. Then half-fill the bath with very warm water. Add 2 cups (500 ml) of whole milk powder and stir in. Mix in half a cup (125 ml) of natural liquid honey. Step in and soak in this most luxuriant all-over moisturizer. Bathe for as long as you wish—this relaxing treatment is not to be hurried.

Cleopatra's Hair Shine Rinse

After washing your hair mix 2–3 teaspoons (10–15 ml) of liquid honey into your rinsing water—do not use any other rinse. If you are blonde, squeeze in a little lemon juice for added sparkle; for darker hair, a splash of vinegar gives radiance. Dry your hair gently under moderate heat, admiring your new glossy tresses.

Cleopatra's Face Mask

Mix 2 teaspoons (10 ml) of honey and 2 teaspoons (10 ml) of milk and smooth over your face and neck. Let the mixture soak in for 10–15 minutes. Splash off gently with warm (not hot) water. Honey is a humectant—it attracts water and keeps water within it—making skin soft and supple and helping to restore its natural elasticity. Repeat two to three times a week.

All-Over Skin Softener

Mix 2 teaspoons (10 ml) of honey with 2 teaspoons (10ml) of vegetable oil and add a couple of squeezes of lemon juice. Lightly rub and smooth the mixture into rough patches of skin—you will literally feel your skin becoming softer and superbly replenished. Rinse off with warm water after 10 minutes or so.







CHAPTER THREE

Propolis

Bees on guard—if you are not meant to be here, then out you go!

Bees decorate the insides of their hives much as we do, with a protective "wallpaper," stretching it over every inch and into the tiniest cracks of the inner walls of the hive. It is called propolis, and this wallpaper only comes in one color, brown. It tastes very aromatic—a little, but not quite, like brandy.

The bees are most heavily laden with propolis through late summer and early fall. They know that the days of pollen and nectar are almost over and, just like you and me, start preparing for winter by inspecting the infrastructure of their home. Bees know that drafty and windy hives are a serious threat to their survival through the winter, so they create their own spackling paste. Every little crack or minute draft hole will be plugged with sticky resins and gums from chosen trees, which act as an all-in-one insulator and sterilizer. Bees spend ages unloading their gathered tree resins once back at the hive—I enjoy watching their ingenuity and the antics they perform as they pummel and mix the resins with beeswax, pollen and saliva. After this process, the resins and gums are reborn as the superior healer, propolis.



Visitors to us at Troway are curious about propolis. "What does it look and feel like? How does it smell?" they ask. I show them honeycombs varnished with it—for that is precisely what the bees do, too. They make the whole honeycomb antibacterial and antifungal by coating it in strong red-brown propolis, which simultaneously fortifies the comb so that it can hold the greatest weight of any building material: 1 pound (450 g) of propolized beeswax can hold more than 20 pounds (9 kg) of honey. The inscrutable workers even glaze the inside of every egg cell with propolis so that once the queen has laid her eggs there is no chance of the developing young catching an infection. All baby bees without exception are brought up in a sterile cradle wrapped in propolis.

I watch the bees as they wipe their feet on the landing board of the beehive before entering the hive. There is propolis here too, forming a sterile doormat. The bees school their sisters on the landing board into unloading this priceless sticky stuff along the entrance to the hive, where it is spread like matting. Every bee has to wipe every one of its six legs over this disinfectant mat so that no disease can be brought into the hive before the testing times of winter.

Imagine a hive in summer heaving with 60,000 bees, all working at full steam and bringing in all manner of spores and contaminants from outside—infection is multiplied by six in bees, for each leg can carry millions of bacteria,










Even the honeycombs are painted with propolis by the bees. Propolis—nature's remarkable antiseptic—is collected from tree resins.

fungi and viruses. And the design of modern beehives gives every encouragement to disease, which thrives in tight, dark spaces kept very warm (roughly at blood temperature) and super-saturated in moisture. The hive should be in microbial meltdown—and yet it is one of the most sterile places on the planet.

Close your eyes and pretend you are a bee flying onto the mat of propolis at the entrance to the hive. Passing through the single entrance, you enter the dark beehive. The narrow corridor winding upward is stuffed on all sides with propolis, but every step forward you take has a sterilizing action. The wall-to-wall propolis decontaminates you just as surely as a hosing down with disinfectant.

Never think that bees don't have to deal with unexpected germs. It's not only bees who seek shelter in the hive: its entrance offers food and lodging to endless snails and slugs as well as bigger brutes like mice. Make no mistake, these uninvited visitors will be stung to death—so surely the invader's slow putrefaction will bring an avalanche of bacterial contamination to the hive? The bees cannot move a corpse outside, that's for sure. But no; they have the problem all wrapped up. They work at a rapid rate to coat the snail or mouse with several layers of propolis and a final icing of beeswax. This stops decomposition in its tracks; mouse or snail mummification is underway and the hive is left sterile again. In fact, bees cover every part of the wax honeycomb with propolis too, to protect it from all manner of bugs, viruses and germs. We might think of it as bee penicillin.

This bee "penicillin" was originally nicknamed Russian Penicillin. Napoleon's invasion of Russia in 1812 proved fatal for the French as much because of tactics behind the front line as those on the battleground. Napoleon's

Raw propolis strengthens and purifies honeycomb. Propolis is at the forefront of medical research into beehive drugs.

surgical teams used black tar to smother amputated limbs or cover surgical wounds—and suffered horrendous casualties. The Russians (a great beekeeping nation) did things differently. Always carrying barrels of honey for food, they never threw away the "empty" barrel. Instead it was transferred from field kitchen to surgeon's tent. The scrapings of thick honey streaked with brown residue were applied over arm and leg stumps following amputation. The stump healed quickly and cleanly; bottom of the barrel was top of the tree for healing since the brown sediment in the honey was propolis. This was valuable not just for its antibacterial action, but because the honey in it hastened the rate of healing.

In World War II, too, the Russian army used propolis ointment on battle wounds. Russia has always been foresighted in the use of beehive drugs, and propolis has been on hand for centuries to prevent and treat infection. Florence Nightingale (1820–1910) made use of propolis in the Crimean War from 1854; her crusade for meticulous cleanliness and method of care, incorporating propolis, resulted in soaring rates of postoperative survival for the soldiers.

How Propolis Can Help Us

In humans, propolis has proven remarkably successful against influenza viruses, when taken before the virus takes hold. It can have a dramatic effect against the herpes virus, too (which causes cold sores on the lips and mouth and ulcers inside the cheeks), and on its unbearably painful cousin, shingles. Within a few days of use, extract of bee propolis can heal the sores. We have many testimonials to its effects here at Troway Hall. Propolis has to be one of the world's greatest panaceas because it is also effective against antibiotic-resistant superbugs (see page 93). Collect your prescription from the hive.

As well as in its raw form, propolis is available as a cream, a liquid (propolis extract), in capsules and as a resin. Keep them in your medicine cabinet as a safe and effective healer, germ buster and rapid rescue treatment for all different types of skin tissue, whether inside or outside the body.

CASE STUDIES

Jessie from Hillsborough, South Yorkshire, was worried out of her mind about her 18-month-old toddler's eczema. She had been prescribed everything the doctor could offer and bought anything else over the counter that might work—all to no avail. After a few applications of soothing propolis cream, the eczema cleared up without any side effects.

Bridget, a nurse from Sheffield, South Yorkshire, suffered excruciatingly when her big toenail was partly lost due to an eczema infection. Nothing prescribed by her doctor had any effect. Propolis cream swooped into action, the infection cleared up and her life returned to normal.



Propolis cream, capsules and liquid play increasing roles in combating infection.

Using Propolis Cream

Apply propolis cream direct to the skin to treat psoriasis, eczema, acne and burns. Do the same for allergy rashes and dermatitis of all descriptions, from soothing bleeding diaper rash and scaly blood-red patches of psoriasis to repairing fungal infections. Teenagers adore this cream and its ability to immediately calm down embarrassing rashes on the face or red dry patches on the hands. After a few days' application, skin usually appears quite normal.

I recommend that you leave a patch of skin untreated with propolis cream in order to judge its effectiveness. Also take a "before" photo of your blotchy skin and an "after" picture following two to three weeks of treatment.

Using Propolis Liquid

Propolis liquid (or extract) has an unbelievable effect on cuts and infections, but is especially well regarded for healing problems of the mouth or gums, such as periodontal disease and painful inflammation of the gums, cold sores and mouth ulcers. One whole dropper full of propolis liquid (extract), or approximately 30 drops, applied three to four times per day will soon reap rewards. Many people squirt several drops of propolis into the mouth every day as a preventative treatment for oral hygiene and to maintain healthy teeth and gums. It freshens the breath and cleanses the teeth of plaque. Propolis liquid also has an anesthetizing effect and many dentists recommend it for root-canal problems, mouth ulcers and gum inflammation. Use one dropper full every time.

When diluted with a little warm water, propolis liquid makes a marvelous gargle for sore throats and laryngitis. Many professional singers and radio announcers carry this tiny bottle of instant calm and healing everywhere.

Propolis extract boosts the immune system against colds, coughs and influenza. Taking a dropper every day during fall and winter months is a preventative rather than a cure—I can vouch for this wholeheartedly. At the Institute of Microbiology at the Silesian School of Medicine in Sabrze-Rokitinca, Poland, Professor Dr. Scheller Stanislow has found that propolis is a great boost to the immune system and makes injured tissue and cells

CASE STUDIES

Angela from Seaton, Devon, had to phone and give me (and the bees) her unbridled thanks for propolis extract. Her husband had been fighting a cut on the inside of his mouth for weeks. A prescription from his doctor brought no change. Angela suggested propolis extract and three days later he was nearly back to normal.

I can vouch for the extract myself. During November and December when I am working along the slopes of the valley marking out Christmas trees, it is often so cold that my teeth almost rattle within the gums. The wind whistles around them and believe me, the pain affects the gums, teeth and ears. Out comes the propolis extract—I squirt a few drops around my teeth and gums and within a few minutes all pain has gone. My gums heal and feel better in a few days despite the weather.







For colds, coughs and sore throats dissolve several drops of propolis liquid (extract) in a little warm water. Gargle and swallow. Repeat.

heal faster. Further research has shown positive effects on the control of cancer cells and tumors in mice by the use and application of propolis.

In order to reach the upper respiratory tract, use propolis extract made into a spray. This is easily bought ready-made and is as avidly used by hay-fever sufferers just as much as those with wheezes and sneezes from colds and coughs. Either spray it into the back of the throat through the mouth or up through each nostril. This provides great relief for sinusitis, laryngitis and sore throats during winter coughs and colds and is brilliant for easing swollen sinuses during the hay-fever season. Hay-fever sufferers should also arm themselves with pollen capsules (see page 133).

Using Propolis Capsules

Propolis can have an anti-inflammatory action on tissues, muscles and the swelling that develops around eroded joints. Nothing can cure arthritis, but relief from excess swelling and the pressure this exerts on muscles and nerve endings can be improved with a daily dose. Take three or four capsules all at once in the morning and repeat daily. You should notice a difference after about three weeks. Raw bee propolis is present in propolis capsules and can reduce joint pain in the knee, hip, shoulder, elbow, neck or ankle joints. Joint aches and twinges are not the preserve of those of mature years. Far from it. I know people of all ages and varying lifestyles—carpenters, decorators, nurses, farmers—who revere propolis for its ability to reduce swelling and therefore pain.



You can use propolis liquid and olive oil for ear-wax removal and clarity of hearing.

CASE STUDIES

A carpenter and his friend, a carpet fitter of no more than about 37, were skulking around the shop door. Finally, they handed me a piece of paper with the word "propolis" scratched on it. I asked them what type. Their faces reddened—they were embarrassed that they could neither pronounce the word nor define what they wanted; they just knew that their builder friend was taking it and his knees were so much better that he was smiling not grumbling in the morning. It's the capsules you want, I explained. I never try to convince anybody to take them because bee products speak—no, yell—for themselves. These men had tried glucosamine, vitamin supplements, healing balms and injections to little direct effect on their painful joints. They soon returned, delighted with the loss of pain and a definite reduction in their swollen joints. The carpet fitter especially had previously had knuckles so swollen that he was contemplating selling his business because of the pain.

Using Propolis Resin

Stradivarius used propolis resin (two parts propolis, five parts linseed oil) as a varnish to protect his violins, which eventually gave his instruments their distinctive mellow timbre. We supply propolis for the mouthpiece reeds in regimental bagpipes to prevent them from disintegrating too quickly because of the saliva.

The Victorians had their nannies rub their children's toys with it to prevent infections spreading between members of their large families. Not only that, when their children were born a little propolis resin was grated onto the umbilicus so that healing would occur without infection.

Parts of the world still insist on using propolis varnish on canoes and light riverboats for extensive protection from weather and water. Linseed oil on antique furniture or woodwork still has propolis as an ingredient for treatment and protection of wood.

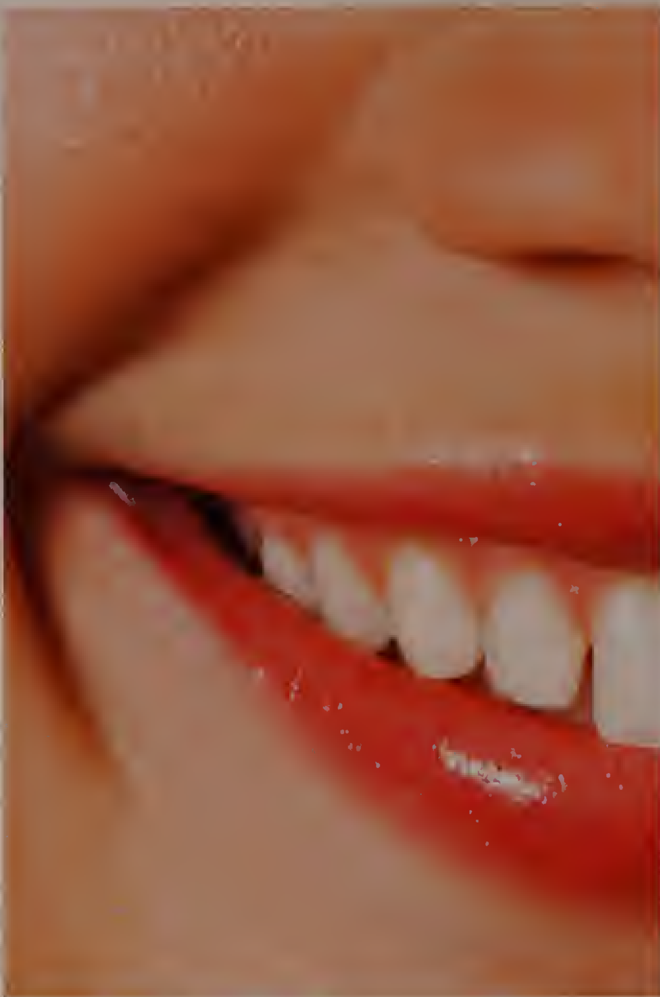
HARD OF HEARING?

Two years ago a friend told me to talk to her. "And again," she demanded. I nattered on, but wondered why, because she was hard of hearing. I stopped talking. "Carry on," she snapped. "I just wanted you to know that I can hear now."

I asked if she'd had an operation. She hadn't. She had noticed that I use propolis a lot and a friend—an ex-ear, nose and throat nurse in Poland where beehive preparations are used because they work and often because there is no alternative treatment—told her to mix propolis extract with a little olive oil and drop the mixture into her ear canals. She then plugged her ears with cotton balls for two or three days. Nothing happened. After about nine sessions over a month, the funny whistles and whizzes she had shared her life with almost cleared and she heard her dog bark like never before. Her hearing was back—a little less than before, but definitely back. My friend still puts propolis extract and olive oil into her ear canal two days a week to maintain the effect and reap the antibacterial benefits.



Cracked and chapped lips? Propolis lip balm is the ultimate healer. Propolis lozenges (far right) help soothe sore throats.



NATURAL GERM KILLER

When the bushcraft and survival expert Ray Mears toured the Canadian wilderness in his TV series *Northern Wilderness* (2009), he visited the tepees of the Tlicho people. I was fixated as he learned more about how ancient tribes thrived in such challenging habitats and about their respect for the land and its flora and fauna. But what fascinated me most was the green, bushy ground-covering in the tepee, formed from the soft ends of the branches of fir trees. Their aromatic scents and resins acted as both a soft mattress and a natural germ killer. Every few days they changed the tepee floor—like fitting a new carpet. I realized that the Tlicho were using fir-tree resins in the same way as bees use propolis. Even if unaware of the pharmaceutical attributes, they knew the fir trees were life-giving and refreshed the body, and particularly made sure that their children slept on these branches because it made them healthy. They hadn't cut the line between nature and themselves. I applauded when the Tlicho tribe stated that they only took from nature what they needed and no more. Something we can all learn from.

Propolis Lip Balm

With snow, ice, wind and sun, lips can become dry and chapped and sometimes bleed. Time for the super-healing and soothing properties of propolis and beeswax.

Position a deep heatproof bowl over a pan of hot water. Melt together half a 1-ounce (30 g) beeswax block and 1 teaspoon (5 ml) lanolin with 3 teaspoons (15 ml) of baby oil. Add propolis extract drop by drop to your required strength (10–40 drops)—but not enough to cause the lip balm to collapse from its semisolid state. Allow to cool a little and pour into little sterilized jars, which are easy to carry around, and keep applying until your lips are lovely and luscious again.







CHAPTER FOUR
Pollen

Bee pollen helps thousands of hay-fever sufferers worldwide and can be taken condensed in pollen capsules.

Thank heavens I do not suffer from hay fever. Hay fever is nature's weapon of mass infection, responsible for millions of days off work, poor exam grades and hatred of the great outdoors in spring and summer. You have only to watch our unending stream of Internet orders every year as people stock up on pollen capsules and honey to see the enormity of the problem—and not just through spring and summer, for allergies can be perennial. Hay fever is caused by plant pollen, but bee pollen provides an antidote.

The cause of hay fever is tiny pollen grains released from plants in their zillions. They cloud the air and gather on everyday surfaces indoors as well as out, from concrete and cars to clothing and pets. Plant pollen can get into every nook and cranny—a dot this size . can be home to 30 or 40 pollen grains, meaning that on any journey you will be breathing in hundreds. The distressing symptoms are the body's reaction (or allergy) to these ingested grains.

About 20 percent of the UK population suffers from hay fever, around 40 percent of young adults in Australia and 40 million people in the United States. Around the world about one in four people with Western lifestyles has hay fever. Sensitivity to pollen can run in families, occurs more often in men than women and sometimes is accompanied by bronchial asthma and eczema.

Hay fever was virtually unknown before 1800 in Europe and the Americas; the condition began to rocket in the 19th century, but has caused widespread mayhem only during the last hundred years. Why has there been such growth in the condition? It seems to be a curse of our modern lifestyle and almost certainly is exacerbated by air pollution and clean homes. Decades ago, families tended to have more children, which meant a greater assortment of germs being handed between siblings. The larger family group had a chance to reinforce their immunity by coming into contact with a wide spectrum of foreign proteins. We have become obsessed with rubbing chemicals into work surfaces and floors and this can prevent children from building up a strong immunity. It is interesting to read studies showing that the children of farmers suffer much less from allergies and hay fever—romping with the sheepdog, handling lambs and gathering hay all expose children to clouds of dust and dander and seem to help them shrug away hay-fever crises in their later years.

POLLEN ATTACK

In Japan, hay fever was unknown 50 years ago and now as many as 20 million people are severely affected. Millions of cedar trees were planted after World War II and have never been felled in the proportion once predicted. The pollen from these cedar trees causes mayhem in Tokyo every spring, when face masks and goggles are the order of the day in order to protect people from its effects. Humans are not the only species who suffer from the pollen proliferation—even Japan's snow monkeys have fallen victim to cedar-tree pollen. Their difficulty in eating is obvious when pollen blooms are high and inflamed air passages block their delicate noses.



Pollen grains collected from flowers by the bee returning to the hive in two big baskets!



Hay fever ruins lives; the symptoms are similar to a bad cold that never says good-bye. Sneezing, runny nose, itchy eyes, nasal congestion and severe headaches all take their toll. Hay fever is also known as allergic rhinitis, which essentially means a runny nose, but it is the cause of the runny nose that is important. Pollen's protein overcoat triggers a violent reaction—almost as if the body were being threatened by deadly bacteria. The consequent inflammation in the nasal sinuses and air passages is directly linked to massive amounts of histamine in the bloodstream, produced in part because the body becomes confused and mistakes pollen for bacteria—therefore reacting as if inhaled pollen were the enemy. Pollen is a foreign protein to which our body overreacts causing the release of histamine—when thick sticky mucous runs from the nose and eyes, which become swollen and itchy, with any number of other wheezes and sneezes, signaling to you that you have pollen allergy. Asthma and hay fever together are uncharitable bedfellows, leading to the added difficulties of wheezing and laborious breathing.

There is massive earning potential in the supply of tissues, drops, decongestants and antihistamines to hay-fever sufferers. Their custom is worth millions in revenue to drug companies. But many conventional medical preparations such as antihistamines and steroids have side effects: those who take them complain of drowsiness, nausea and lack of concentration. Many people complain to me that they cease to be effective after one season.



Dried bee pollen will last for a few years. Taken daily in capsule form it is excellent at combating hay fever.

Helping Yourself

You can start to protect yourself from pollen by taking a few simple precautions. Skin is constantly exposed to air currents and pollen sticks to every square inch of it, invading every wrinkle and becoming trapped between strands of hair. As you wipe away tears from swollen eyes or mop your nose, your pollen-laden fingers spread it about. Habitually wash your hands and face and shower the rest of your body as frequently as possible.

Most hay-fever sufferers are blissfully unaware that drying clothes outside is to commit the greatest sin of all. Sheets, towels and every garment of clothing act like a wet mainsail, forming an enormous surface area to catch pollen grains. It is akin to blotting paper, so it's no wonder that so many sufferers detest going to bed, when symptoms can multiply beyond endurance. Invest in a clothes dryer and watch your problems decrease.

ANIMAL AID

It is amazing how many horses and dogs sneeze and wheeze through summer. Mixing bee pollen with their meals will help. Use approximately 12 pollen capsules for a horse and four to five capsules daily for a Labrador or similar-sized dog. You may notice that many animals also suffer from itching and sores during the hay-fever season due to high pollen levels in grass and hedges. Relieve by applying propolis cream twice daily.

RELIEF FOR POSEURS

The most tragically funny scene braked hard at my heels—a young man posing in an open-top sports car streaming with hay fever and blubbering for help. He had every anti-hay-fever potion beside him, plus a little dog wagging its tail. "You are my last resort," shouted the man. "My sister takes your pollen capsules—I am willing to do anything that will help me."

"Well, look at yourself," I replied. "Sell your car to begin with and buy one with a roof. Make sure the air-conditioning has pollen filters and treat yourself to wraparound sunglasses—hay fever can be an excuse to pose around even more! Finally, get rid of the dog—his fur is no doubt drenched in pollen."

Handing the dog back was easy (it was his mother's), but he didn't sell the sports car, just lowered the hood only for brief periods, or so he confessed. But he has thrown all the potions away. Like hundreds of sufferers, this young man found almost instant relief in pollen capsules.



Keep lawn grass cut short to avoid the effects of excessive free-floating pollen.

LAWN CARE

Counterintuitively, pollen does not always concentrate in a garden. Believe it or not, a thick but short-cut lawn is one of the best places to avoid free-floating pollen. As it settles, the pollen percolates through the grass, taking it well away from your nostrils or mouth, protecting you from its effects. Any floating pollen comes from flowers and trees at the garden's periphery.

Tips for Relieving Hay Fever

Take heart—there are easy natural ways to lessen the symptoms of hay fever before investing in pollen remedies.

- Close all windows and doors.
- Dry bedding and other washing in an electric dryer—never outside.
- Avoid walks and country pursuits.
- Try not to play sports on grassy pitches and keep your lawn mown as short as possible.
- Take holidays near the sea—coastal breezes help keep the air clear of pollen.
- Wear sunglasses to stop pollen from getting into your eyes and to conceal red eyes.
- Smear Vaseline at the entrance to each nostril to trap pollen, preventing it from entering your body and triggering symptoms.
- Buy a car with pollen filters fitted in the air-conditioning.

Relief from the Hive

Bees don't get hay fever. They should; they put their heads down millions of flowers throughout their life's toil, but they are surrounded by nature's own antihistamine, bee pollen. So how does bee pollen help relieve hay fever? Unlike plant pollens breathed through the nose and mouth, pollen taken in capsule form is not raw, but processed by the honeybee. This gives it amazing healing properties. The honeybee again has the answer.

One of the wonders of beekeeping is watching a little worker bee as she sets off from a flower after collecting its pollen. The bee whips her long tongue (proboscis) around each pollen basket to coat it with nectar and saliva, like strapping her suitcase together before take-off. She takes off back to the hive with full fuel tanks of pollen. Look at the photo of an acrobatic worker bee on page 127: notice the heavy loads of yellow pollen collected from maybe 50 or 60 flowers and packed into a purpose-made "shopping basket" on either side of her hind legs.

So bee pollen is different from the pollen that triggers your symptoms because it is combined with the natural nectars and saps from the flowers the bee has chosen to visit and then stirred with bee saliva and innumerable other natural secretions, which give it anti-inflammatory, antibacterial and antifungal properties. The bee pollen carries enough common allergens to desensitize your body and make your spring and summer worthwhile again—whichever type of tree or plant you are sensitive to. It desensitizes your body's reaction to airborne pollen





because it is absorbed directly through your stomach and gut wall. Once the pollen is inside your bloodstream, your body starts a process of developing immunity to it. Inflamed swollen eyes and nostrils return to normal.

I never filter out bee pollen when making our honey—it is far too precious because honey is indispensable in the treatment of hay fever as well as asthma and all manner of allergies. To find the best honey to ease your symptoms, look for honey that looks cloudy around the top rim of the jar; this cloudy, pollen-laden honey may also be seen marbling the whole jar. To make a huge difference to your hay fever, eat this honey two or three times a day—about 2 teaspoons (10 ml) at any time. The prescription is almost as old as man himself: whatever the country, religion or folklore, when it comes to a cure for breathing and skin allergies, honey has always headed the list. The bold 18th-century physician Sir John Hill ordained that honey was a certain remedy for asthma, provided it was taken frequently and a good kind was chosen. This still pertains today: overfiltered and overprocessed honey is not the answer to hay fever because it does not contain the magic bullet—pollen.

How to Take Bee Pollen

The main reason that raw honey helps hay fever and asthma is because of the bee pollen within it. But taking concentrated bee pollen in capsule form is much more effective in wiping out sneezes than just eating honey.

Bee pollen is a shortcut to hay-fever relief and, according to thousands of ex-sufferers, beats any type of over-the-counter medicine. Adults need four to six capsules of bee pollen daily (taken continuously from late winter to early fall) and children under 8 years of age need to start with one capsule daily, then two, then three or four as their symptoms dictate.

Bee pollen works best when taken in advance of pollen avalanches, so try to set up a defense ring of desensitivity around your body by taking the capsules well before you are choked by uncontrollable pollen counts. However, capsules will help you to cope pretty well even if you forget to take them in advance. If you have never had hay fever, you can boost your future tolerance and give your body a big boost by sprinkling honeybee pollen over cereal or yogurt for breakfast or even over ice cream.

NOTE Always try a tiny pinch of bee pollen before taking a full dose for the first time. This will reveal whether

AN EXTENDING SEASON

Pollen is released from plants and trees much earlier than in former years. As the seasons begin to merge into each other and flowering occurs ahead of expectation, the hay-fever season becomes elasticated and stretches beyond those months previously known for high pollen counts. Pollen that was customarily released from trees and plants between February and March in the UK and North America now might occur in January if the weather is mild. Hazel and willow trees have been notorious for releasing pollen well before expected in the UK. Throughout the United States and Europe, pollen from birch trees is one of the major allergens. It bellows out from vast acreages throughout Scandinavia, and is then blown to mainland Europe and the British Isles. Changes in agriculture have affected sufferers, too. Two crops of canola oil are now grown annually, extending the season of misery for hay-fever sufferers. New types of peppery aromatic canola also, apparently, now cause more hay-fever symptoms than the pollen itself.




Honeybee Pollen
iron & energy





Pollen capsules for hay fever (top left); pollen sprinkles—good on cereals, ice creams or yogurt (top right and bottom left); an open jar of unprocessed honey with the telltale pollen residue (bottom right).

you are allergic to bee pollen. I have never met anyone who is, but it is better to be sure.

Immunotherapy using raw pollen extract is thought to be the last-ditch attempt to desensitize the body to pollen by slowly injecting pollen into the blood system. It is only given under medical supervision so that your reaction can be monitored. Immunotherapy is the only way to get rid of hay fever completely rather than simply shroud its symptoms with antihistamines and decongestants. It takes a long time and you may have to commit to years of injections to make your body less sensitive to airborne pollens.

Natural Health Food

Bee pollen is "mother's milk" for baby bees in the hive. It is packed with protein, vitamins and minerals that make other foods fade into the landscape. Cheese, eggs and meat fall at the feet of this superfood in terms of protein, vitamin and mineral content. Unbelievably, bee pollen, weight for weight, has more protein than any other animal source. Many athletes use bee pollen as a supplement to boost their stamina and performance. It is also packed with bioflavonoids, which magnetize the body's free radicals and pave the way for a healthy immune system. Indeed, theoretically you could live on just pollen and water since it contains so many nutrients; it just might get tedious after a while.

Russian and Swedish researchers have delved deep into pollen and its medicinal attributes.

Bee pollen contains:

- 35 percent protein
- 35 percent carbohydrate
- 35 percent fatty oils
- 15 percent amino acids
- 35 percent water
- and other micro essentials such as vitamins A, B^1, B^2, B^3, B^5, B^6, B^{12}, C, D, E, P and folic acid; minerals calcium, copper, iron, phosphorus, potassium and sodium; plus 28 micronutrients and bioflavonoids; and 2 percent inclusions that are unidentified. A staggering list!

No wonder bee pollen is listed as the food of the gods! Also it is amazing to witness firsthand that bees only collect pollen with the highest nutritional content and as a result bee pollen contains over 40 percent protein and amino acids. Research from the Royal Society of Naturalists stated that: "The nutritional tests supervised by the station at Bures, Suffolk, worked on hundreds of mice, which demonstrated that pollen is a complete food, that it is possible to let several generations be born and live without the least sign of distress, while nourishing them exclusively on bee pollen." From obesity to hay fever, energy and stamina, digestive and immune-system disorders, bee pollen has been approved and honored for its supreme role. For those who, for one reason or another, cannot take or like honey, bee pollen in pollen parcels (sprinkles) will hit the metabolic spot when sprinkled over cereal, oatmeal, yogurt and ice cream—or just eat it raw as I do. It is delicious and is the halfway house between sweet and savory tastes.

Bee pollen contains lecithin (the fat buster) and can be used as part of a calorie-controlled diet. Some important studies have been conducted into the role of bee pollen in helping to control body weight. Eat 2 teaspoons (10 ml) of bee pollen an hour before meals, which will

Fields of canola are a major cause of suffering for those with hay fever.

help to suppress a ravenous appetite—you have nothing to lose but weight. S. Blauer of the Hippocrates Health Institute states: "Bee pollen minimizes, reduces or eliminates the normal person's cravings for heavy concentrated protein . . . [bee pollen] aids the digestion of other food."

Bee pollen is a true superfood for all generations and is packed with so many ingredients not just to sustain life, but enrich it too.

For Men Only

Pollen can aid prostate health. At birth, a baby boy's prostate gland is tiny but by the time he is 20 it has grown to the size of a walnut. By the age of 50, the prostate can reach the size of a tangerine. It lies under the bladder and forms a doughnut around the tube carrying urine from the bladder to the penis (the urethra). Enlargement of the prostate means a restriction of the urethra and then problems ensue. Aging and prostate problems go hand in hand; 70 percent of men will have prostate problems, however mild, by the age of 70.

Symptoms of prostatitis include frequent urination, particularly at night, dribbling, low pressure when urinating, painful urination or a burning or scalding sensation and even incontinence. There are tremendous global differences, though. Men living in China, India and Japan have the lowest rate of prostatitis and prostate cancer, but if they move to the United States their incidence of prostatitis rockets up to 10 times. The culprits are a combination of factors: environment, diet, chemicals and genetic inheritance.

Natural pollen is used in prostatitis care around the world, particularly in Europe and the Far East, in the form of bee pollen or specially formulated capsules of pollen and saw palmetto berries. They provide relief from severe and frequent urination and the discomfort of an enlarged prostate. Bee pollen relaxes muscle, making it easier to empty the bladder and is also a well-known anti-inflammatory that can help to reduce the swelling in the prostate itself. To maintain good functioning, the prostate gland requires zinc, but in order not to overdose on this mineral, it's best to gain it from food sources—the more natural the better. Bee pollen has a high zinc content—4 ounces (110 g) provides up to 40 percent of your daily requirement. Bee pollen is formulated for ease in ready-made capsules and three a day makes a significant improvement to the lifestyles of so many men. Vitamin D also seems important in the prevention of prostate cancer, and pollen can help the body produce vitamin D if men ensure that they have sufficient exposure to daylight even in the winter. In winter get outside for at least half an hour—on dull and dreary days try to locate even weak streaks of sunshine for more than one hour.

CASE STUDY

One of my clients, a delivery driver, had undergone more than 20 biopsies for inflammation and prostate cancer, and decided to try bee pollen and saw palmetto capsules. After taking them over a period of three months, he found that he no longer needed any surgery, much to the disbelief of his consultant. His prostate had reduced considerably in size and he needed to urinate less frequently.







CHAPTER FIVE

Royal Jelly

Want to live longer? Take notice—the queen bee is bigger in size, sexually fertile, more elegant and outlives her sister worker bees by years. All thanks to royal jelly.

Honey, propolis, pollen and beeswax have innumerable benefits for health and well-being, but the crown jewel of the hive is royal jelly, lauded by celebrities and health aficionados as the elixir of youth and beauty. The emperors of China and the maharajas of India kept hives for centuries not just for honey, but for this priceless jelly, which promised eternal youth and energy, and only the very best royal jelly was given to the pharaohs in ancient Egypt to ensure that they enjoyed a long and vigorous life. Royal jelly is the most precious jewel in the beehive because there is so little made—its use is reserved for the monarch, the queen bee.

Royal jelly is a white creamy substance responsible for giving the queen bee a long, long life plus an elegant and large body, which makes her very fertile. She is the only honeybee in the hive biologically destined to lay thousands of eggs, becoming a dedicated egg machine during her four years of life.

For the rest of the females in the hive it is tough luck—they are workers doomed to die after 10 or 12 weeks of hard labor in tough weather conditions on a basic diet of pollen and honey. The workers never enjoy sex, for they have no reproductive organs and therefore never produce eggs. They are genetically programmed to work for the greater benefit of the hive and their thousands of sisters, whose primary focus is the queen and all her needs (see pages 26–32).

Workers remain biologically immature because, in bees, only one substance makes you "by royal appointment"—royal jelly. No one knows why at a certain time the whole hive of 60,000 worker bees suddenly decides it is time for a new queen. But when they do, the royal-jelly makers in the hive are given the alert. Every new baby bee is given a first few feeds with royal jelly but then this is withdrawn from all except one, who is chosen to become queen. Royal jelly then becomes the exclusive substance of the queen bee throughout her egg-laying life.

Royal jelly changes the baby's body from a worker into a queen bee, an insect of the highest beauty. Royal jelly makes the queen 40 percent larger as well as longer and more elegant. This puts her in pole position—she will live 30 times longer than other bees in the hive (up to four years) as well as becoming one of the best egg layers in the animal world. No wonder royal jelly is hailed as the fountain of youth.

The Secret of Eternal Youth

To maintain a long life we have to fight off disease as quickly as possible by maintaining an excellent immune system. Fresh royal jelly kills many strains of bacteria within a few seconds and others in under a minute. The Food and Drug Administration in the United States has established that royal jelly is more powerful than formalin (bodies are preserved in this lethal liquid), carbolic acid and most other types of disinfectants when fresh.

Royal jelly is a great source of vitamin B^5 or pantothenic acid. This is held in high esteem for its de-stressing and anti-aging effects. Animals fed extra pantothenic acid throughout their lives live a good deal longer than those that are not. Dr. Roger Williams, discoverer of pantothenic acid, added extra pantothenic acid to the food of one group of rats, while the other group received a normal diet. The rats supplemented with extra pantothenic acid lived 18 percent longer than the others—13 years longer in human-life terms. He never



Why do celebrities look younger than us? The answer may be that many of them use creams containing royal jelly.

ROYAL JELLY TESTIMONIALS

His Holiness Pope Pius XII (1876–1958) The Pope's physician Dr. Paul Neihans prescribed royal jelly to speed the Holy Father's recovery from a severe illness. The doctor stated that royal jelly revitalized the glandular system in a similar way to fresh endocrine cells. These produce hormones throughout the body, controlling energy, fertility, metabolism and vigor.

Diana, Princess of Wales (1961–97) Declaring that royal jelly helped enormously with morning sickness during pregnancy, Princess Diana often made it part of her diet. The tone of her skin, her inner glow and lively vigor were just some of the outward signs of its benefits. Other members of the British royal family are known to take royal jelly for energy.

Barbara Cartland (1901–2000) Step-grandmother of Princess Diana, this veritable romance queen is best known for penning more than 500 books. A popular and flamboyant figure, she lived life at full throttle, enjoying motor racing and gliding and founding the National Association of Health in the 1960s, which led to hundreds of health-food stores opening. She fought for better conditions for midwives and nurses, the elderly and Romanies. She had a special belief in the healing and rejuvenative powers of honey and royal jelly in particular and wrote an extraordinary book, *The Magic of Honey*. She almost made 99 years of age and behaved half her age, always looking, like her clothes, "in the pink."

advocated such an astonishing interpretation, but Dr. Williams held the belief that with diets supplemented with extra pantothenic acid and vitamin C and other promising nutrients, we could all strive to live 10 years longer. Royal jelly and pantothenic acid go hand in hand.

But perhaps the most anti-aging ingredient within royal jelly is its unexpected gelatin, the vital starter for collagen production in human skin and tissue. Young skin is elastic and fresh looking thanks to the protein collagen. As collagen production plummets when we get older, wrinkles, furrows and blotchy skin result, so it's no wonder that collagen has become the antiwrinkle wonder of the cosmetics industry, able to plump up and firm the outer layers of skin, which become thinner and fragile with advancing years. Royal jelly also contains a grand selection of vitamins, proteins and hormones, which are so powerful they can turn a worker bee into the queen.

Royal jelly has a list of nutrients as long as your arm and yet the world of research is baffled by it—they cannot work out the complete formula. Nevertheless, many luminaries of the film and fashion world swear by its effects, like oldies who seem ageless, such as Jerry Hall and Cliff Richard. Japanese women are especially fond of royal jelly, as Japan has the highest consumption of royal jelly in the world.

Royal jelly may help the brain stay young, too. Interestingly, the Japanese have a lower incidence of Alzheimer's than most Western countries—this could be due to lifestyle, or perhaps to consumption of green tea and its natural bioflavonoids, but it could also be a belief in the products of the bee and royal jelly. Royal jelly contains a compound—acetylcholine—that is paramount in the way the body sends messages through the nerve network. Levels of this ace nerve transmitter fluctuate



Royal jelly can also be taken internally in the form of capsules to aid youthful radiance and sustain the memory.

during our life span, decreasing significantly as we get older, causing short-term memory loss, forgetfulness and lack of concentration. Royal jelly can create acetylcholine.

The never-ending list of attributes of royal jelly is so long it becomes embarrassing. Stories from around the world abound about royal jelly and its benefits, from cholesterol busting by stopping the craving for high-calorie fatty foods to reduction in heart disease and increased physical and mental activity. Royal jelly may perhaps synchronize a multitude of nervous and endocrine secretions within our cells, for it is known that royal jelly can switch genes on and off in bees; there is a possibility that it could do the same in humans.

Taking Royal Jelly

Royal jelly is a rare substance and very difficult to extract from the hive. If bought in vials of fresh liquid, then it must be refrigerated and its shelf life is short. I would be highly wary of its derivation—check this out.

The best way is to have royal jelly and possibly ginseng (for well-being) lyophilized or freeze-dried in capsule form. Certainly two or three capsules per day taken over a period of weeks will yield their own bounty in the energy levels in your body and the improvement of your physical and mental well-being. We supply a number of pharmacies and health-food stores and there are other trustworthy makes available. Many women swear by royal jelly during menopause or difficult menstrual periods to help alleviate symptoms such as abdominal pains, hot flashes and general lack of energy.

The triad of pollen, propolis and royal jelly from the hive offers us so much. Taken every day and enjoyed together as nature intended, they are evidence that bee products are potently enhanced when enjoyed synergistically rather than separated into parts. My own observations have lead to one important conclusion: all beehive medicines seem to enhance the human metabolism when taken with honey. Honey is the river of life in the beehive—and in the human body, honey and bee drugs enhance our own vital forces.







CHAPTER SIX
Beeswax



Perfect architecture in the form of hexagonal beeswax—a storage miracle.

The most expensive wax produced by the natural world, beeswax has been the highest-prized product of the beehive for centuries. In medieval Europe, for example, beeswax would fetch more than 10 times the price of honey—land taxes and tithes were paid to monastic orders in beeswax, such was its value—and had more than 500 uses. Most important, beeswax meant light, but it has also played a vital role in wound healing and cosmetics since ancient times. High in antibacterial and antiallergenic properties and nourishing for the skin, beeswax has also become an invaluable part of the modern cosmetic and pharmaceutical industries,



which utilize it for a number of their products.

Beeswax forms the very architecture and furniture of the beehive. The hive comprises thousands of hollow hexagonal cells made of beeswax to hold honey and develop baby bees. The beeswax is molded into a honeycomb of hexagons. Everywhere that the bees walk, feed, touch and communicate is formed from a platform of hollowed-out beeswax.

The beeswax honeycomb is a very intelligent design. From all the possible shapes that bees could have chosen to make their home—triangles, squares, circles, octagons—for millions of years they have chosen the hexagon. Beeswax hexagons fit together in the honeycomb without leaving gaps and so do not waste any space. The hexagon is one of nature's most efficient shapes because it requires a minimum of material to hold maximum weight. This means that less beeswax is used to support the greatest weight of honey—beeswax can support 20 times its weight in honey. The beeswax honeycomb is even more efficient because the bees make it double-sided for optimum honey storage.

In a good year, a beehive might yield up to 100 pounds (45 kg) of honey—when the honeycomb is at maximum capacity. In a bad year it may yield nothing at all. After all, the bees need more than 40 pounds (18 kg) of honey for themselves just to stay alive over winter. In a normal season we probably retrieve 4½ pounds (2 kg) of beeswax from each hive.

Beeswax Light

Throughout the centuries there was no other source of light at night but candles, and the early Egyptians and Romans made them from beeswax. By medieval times,



Except for the odd beehive or two kept by villagers, most beekeeping in Europe was perfected by monks. With the expansion of monasteries in the 13th century, beekeeping began on a grand scale.

the simplest and cheapest light would have been made from rushes or reeds dipped in leftover kitchen fat, which burnt with an acrid smell and dense black smoke. Later, cheap tallow candles made from cow or sheep fat were burned, although they were disliked. Top-quality candles have always been made from beeswax. It burns sweetly and sensually, producing a smokeless bright light, and it lasts longer than other types of candles. But beeswax candles were the territory of the rich and privileged. The great palaces, halls and temples would have needed hundreds of beeswax candles daily, so they were in great demand and fetched exorbitant prices. Beeswax candles were a measure of status. They are still. Why not try them for yourself, especially on festive occasions? They burn with an orange glow and emanate honey aromatics throughout the home.

BEESWAX AND RELIGION

King Henry VIII (1491–1547), noted for his lack of sentimentality, closed all monasteries and Catholic orders in England during the Reformation (after 1517). Until this time, churches had consumed huge numbers of beeswax candles—all this was put asunder after the Pope denied Henry his demands for divorce. The dissolution of the monasteries was the consequence and the Church of England was born. Beeswax candles, associated with Catholic ritual and spiritual blessings, were banished. Today beeswax candles remain well established in the Catholic faith. In Rome you can seek and find the icon of the bee everywhere in and around St Peter's Basilica—for Roman Catholics, the bee remains the symbol of purity, industry and community.

Cosmetics and Beeswax

Beeswax is one of the oldest of raw cosmetic ingredients, used in toiletries and creams since earliest times. The ancient Egyptians loved to look after their hair. They mixed beeswax and resins as a setting lotion to color and also maintain their locks to display their male and female beauty. Some of the first lipsticks consisting of red ocher, beeswax and fat set the scene for luscious lips and also acted as some protection from the intense sun. The cosmetics industry is the biggest consumer of beeswax today, used for the manufacture of lipstick, gloss and salves, hand and face cream, foundation, and eye pencils and mascara (especially the waterproof type). The list goes on and on, for beeswax is also part of hair products, from shampoos and conditioners to hair-removal strips. Around 40 percent of international trade in beeswax is for the cosmetics industry – the United States imports around $10 million and exports around $6.7 million worth of beeswax every year. The demand from consumers for more natural products is almost outstripping the supply of beeswax available. Let's hope the bees can keep up.

Beeswax beauty potions have had a centuries-long reputation for enhancing the skin because they nourish, moisten and soften skin almost immediately on application. Beeswax is waterproof yet locks water within its waxy structure, making the perfect moisturizer for face, skin and nails. Beeswax comes in many natural shades of





With their mellow aromatic smell, beeswax candles burn without soot. They are the bee's knees for Christmas celebrations and special occasions.

yellow because of all the trapped honey, pollen and propolis. This makes it astonishingly high in beta-carotene, a bioflavonoid (see page 69) that is converted by the body into vitamin A, which is excellent for the eyes and skin and for regenerating body cells.

Vitamin A is good for problem skin. Vitamin A in beeswax has a cleansing effect, dramatically reducing excess oil and deterring bacterial infection. Beeswax is very helpful for acne, especially when added to propolis cream. Propolis cream made with a base of beeswax is also ideal for skin eruptions or problem skin in men or women. No other skin cream helps problem skin more. Read the label to make sure the product you buy contains real beeswax and propolis. Analyze the labels on jars of cream scrupulously, for the devil is in the lack of detail. The nearer the start of the list of ingredients, the higher will be its concentration. Try to seek out honey, propolis and beeswax among the ingredients, with as few preservatives or additives as possible. Remember that to comply with trading standards, some preservative has to be used. The shelf life of the cream after opening will often be indicated by a figure of an opened jar with a number within. This indicates the number of months the cream inside will remain in excellent condition for use.

Bee's Knees Super-Rich Skin Cream

Melt a 1 ounce (30 g) beeswax block in a deep heatproof bowl positioned over hot water in a pan (never heat beeswax by direct heat). Add 4 ounces (110 g) of anhydrous lanolin mixed into 3½ ounces (100 g) of baby oil. Separately dissolve a teaspoon (5 ml) each of pure borax and honey in half a cup (125 ml) of hot water. Be sure the oils and waxes in one dish and the borax and water in the other dish are completely dissolved and liquid.

Add the water and borax mixture to the oils and beeswax mixture and stir energetically until a white foamy cream emerges. If preferred, stir in 1–2 drops of tea tree or lavender oil to complete this rich cream.

Allow to cool a little, then pour into sterilized jars after cooling a little. Use on your face or body. Keep in the fridge—it will last for about four weeks.

BEESWAX LIKENESSES

Madame Tussauds is home to perhaps the most iconic use of wax of all time, with museums in London, New York, Las Vegas, Washington, DC, Amsterdam, Berlin, Shanghai, Hong Kong and Hollywood. The history of Madame Tussauds goes way back, to the Paris of the 1770s, where Marie Tussaud learned to mold look-alike statues of beeswax and give them a translucent sheen resembling human skin. Beeswax is a wonderfully soft and natural material to work with, especially when reproducing lifelike skin tones complete with realistic warts, pimples and blemishes. The craft has a long history—prominent ancient Romans and Greeks commissioned death masks in beeswax.

Even in modern times we still depend on beeswax for hundreds of products, from pharmaceuticals to paints, bronze and metal castings, and everyday soap.

Natural Medicine

The pharmaceutical industry is the second-biggest user of beeswax, which alongside its ability to soften and rejuvenate the skin, has antibacterial, antifungal, antiallergenic and antioxidant properties. Primitive man used beeswax primarily as an antiseptic and for wound healing. He probably laced the beeswax with honey before sealing and confining his injuries from further infection in an untamed environment. Beeswax has been applied to skin as a barrier against further injury for a number of years. Wounds healed phenomenally fast so its use would have soon become trusted and it was easily available from wild bees' honeycombs, made in tree trunks or twisted branches. Hippocrates (c. 460–c. 375 BCE), the father of modern medicine, helped to codify these ancient medicinal uses, recommending that beeswax be placed on the neck for boils and abscesses.

Beeswax is used today in medical lubricants applied during clinical examinations and for protective coverings. Slow-release coatings on pills, known as enteric coatings, for example, are often made of beeswax. They stop drugs from being digested in the stomach so that they reach the intestines intact, where they can be most effectively delivered. In fact, beeswax coatings are at the spearhead of medical science in targeting various parts of the digestive system for release such as the lower gut rather than the stomach for those who suffer with the form of peptic ulcers. Many sticky ointments and a whole host of healing creams have a base of beeswax, too.

SWEET TREATS

Do you love jelly beans? If so you are treating yourself to beeswax. Their beeswax coating locks in the flavor and color. If you floss your teeth after eating these sticky, sugary treats you will be well served, for dental floss is nothing more than thin filaments of plastic or nylon wrapped with a lubricant such as beeswax. Sometimes propolis and myrhh are added for a sterilizing effect. The whole of the beehive helps to clean your canines and prevent cavities!

BEESWAX AND OIL

From polishes to waterproofing, inks to paints, moldings to lubricants, the uses of beeswax are legion. But none perhaps is more important environmentally than its use in clearing up marine-oil spillage from massive globe-trotting tankers. Tiny balls of beeswax are released onto the spillage; beeswax is waterproof so only the oil penetrates the skin of the beeswax balls. As oil seeps inside the balls, the oil-eating bacteria lying in wait within start the bio-digestion process. Having digested the oil, the harmless bacteria explode into the ocean where they become food for passing fish or other marine life. It is almost unbelievable that beeswax, this irreplaceable natural substance from honeybees on land, can come to the rescue of marine life, coral reefs and mangroves, which otherwise can take up to 50 years to recover from oil pollution.



American Beekeeping Federation
Provides links to beekeeping associations and other industry organizations in the United States and Canada.
3525 Piedmont Road
Building 5, Suite 300
Atlanta, GA 30305
Tel: +1 404-760-2875
www.abfnet.org

The American Apitherapy Society Inc.
Provides information and links on the medicinal use of products made by honeybees, including Bee Sting Therapy.
14942 South Eagle Crest Drive
Draper, UT 84020
Tel: +1 631-470-9446
www.apitherapy.org

National Honey Board
Federal research and promotion board that conducts research, marketing and promotion programs for honey and honey products.
11409 Business Park Circle, Suite 210
Firestone, CO 80504-9200
Tel: +1 303-776-2337
www.honey.com

Canadian Honey Council
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International Bee Research Association (IBRA)
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Apimondia
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http://federation.apimondia.org

Pollinator Partnership NAPPC
Promotes health of bees and other pollinators essential to food and ecosystems. Website has free planting guides for different US ecoregions.
423 Washington Street, 5th Floor
San Francisco, CA 94111-2339
Tel: +1 415-362-1137
www.pollinator.org

Mid-Atlantic Apiculture Research and Extension Consortium (MAAREC)
Provides information and fact sheets on beekeeping for beginners, beekeeping research and extension priorities, honeybee biology, etc.
https://agdev.anr.udel.edu/maarec

The Melissa Garden
40-acre honeybee sanctuary in Healdsburg, California, United States. Practices holistic beekeeping and uses biodynamic gardening methods. Offers workshops, classes and events.
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Dadant & Sons, Inc.
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www.lagrantshoneybees.com

Efita
International Directory of Agriculture, Food and the Environment
Searchable directory with links to beekeepers and equipment suppliers
(select Forestry, then Livestock, then Beekeeping, or search by keyword)
www.efita.org

Bee Source
Online discussion board and directory of beekeeping contacts and supplies, including U.S. and Canadian suppliers.
www.beesource.com

Sue Fox—my great friend and eminent journalist, without whom this journey would never have happened. She is above rubies.

Dowager Duchess of Devonshire—who gave me an interview within minutes of asking her about her daily morning honey treat. Was she not lively and entertaining—and then starkly gave me the answer I had never expected!

Professor Milton Wainwright (Microbiology Dept., University of Sheffield)—specialist in bacteria, fungi and viruses and yet has unbounded respect for those antimicrobials found (and often forgotten) in nature. He spearheads honey research in the UK.

Gill and Paul Smith (Thorne's Beehives)—who have so generously given money to my Children's Charities and have never hesitated to sponsor my lectures to that end.

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Pamela Bradley—my cousin, with an unquestionable grammatical talent seldom seen today.

Mick Leahy—has twelve hundred hives in Australia and has the gift of modesty and majesty—although his talent is awesome.

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Vicky Orchard—my young and vibrant editor who was always there at the end of the phone. She is a "good ideas factory" and had grit and courage working with me around the beehives.



Gloria Havenhand started out teaching and lecturing in biological sciences. Her early experience working for the Ministry of Agriculture and large health care companies compelled her to rethink our modern pill-popping culture. She believes that honeybees, the origin of many pharmaceutical drugs, have been forsaken and forgotten—to our cost. She now looks after millions of bees and runs Medibee, a bee product company, from her home in Derbyshire. www.medibee.co.uk

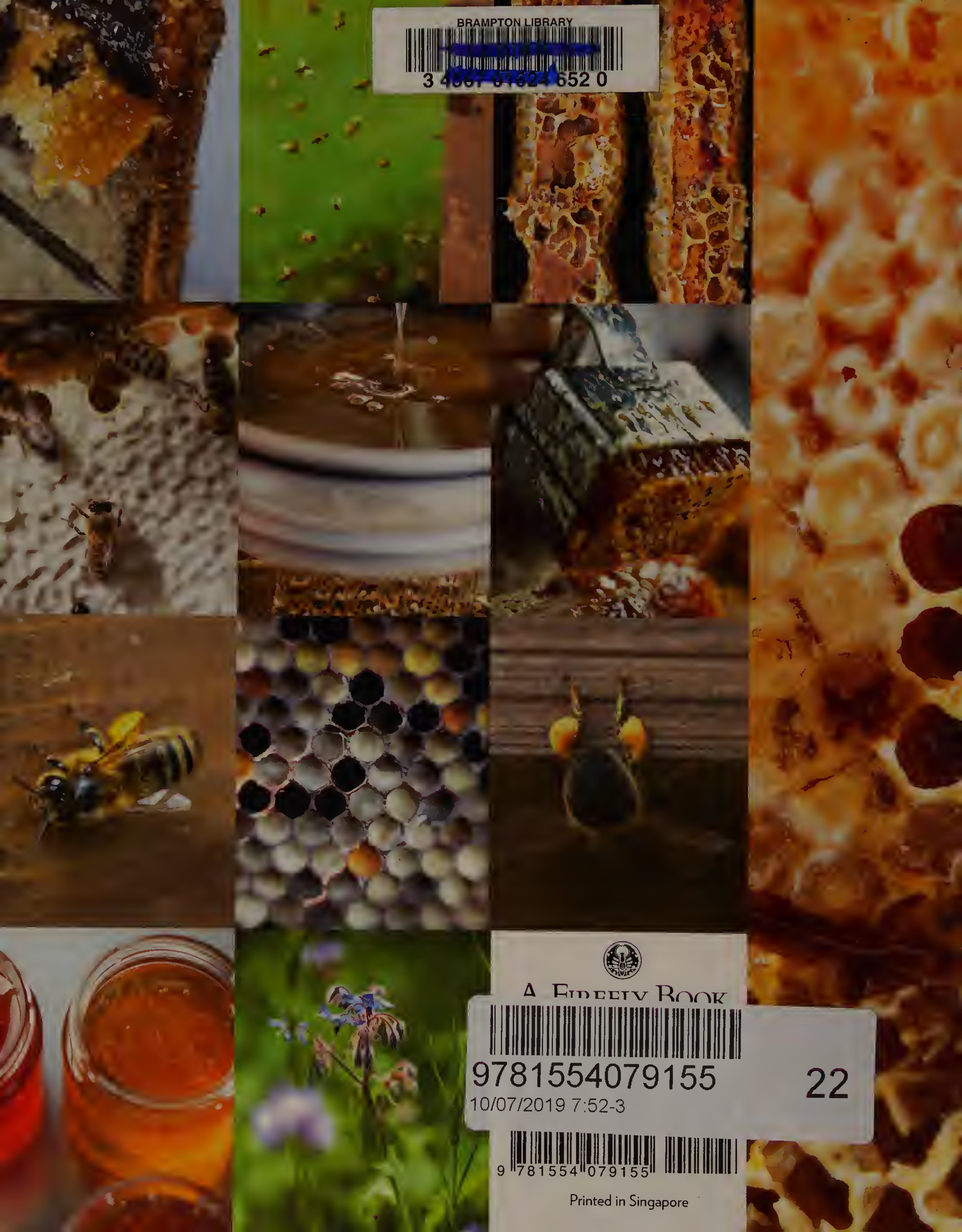
"Gloria's love and in-depth knowledge of bees is truly astounding—she is one of the last true enthusiasts. The academic profession should pay more attention to enthusiasts like Gloria, be they astronomers, ornithologists or beekeepers. These people have a wealth of practical and observational knowledge, which can only be guessed at by so-called experts. This book superbly illustrates this truth."

Professor Milton Wainwright, Dept. of Molecular Biology and Biotechnology, University of Sheffield, UK

"I have known Gloria Havenhand for 30 years. She is one of those rare persons who combines a passion for life and everything in it, a total commitment to rigors of scientific objectivity and method, and extraordinary gifts for the artistic proportion. I have read her new book *Honey: Nature's Golden Healer* which shows all of Gloria's many talents and is a riveting read with breathtaking photography in and around the bee hive."

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